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THE IRON AGE

THE NATIONAL METALWORKING WEEKLY March 2, 1950

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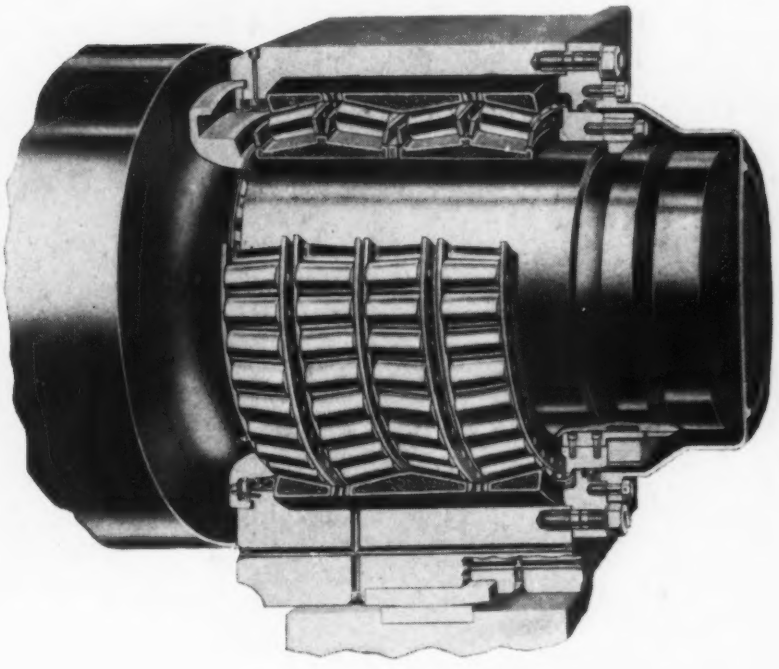
MAR 2 1950



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2. GREATER MILL RIGIDITY. Balanced proportion design of Timken bearings permits larger diameter roll necks than ever before possible with tapered roller bearings. Average roll neck size is 71% of the O.D. of the bearing. Roll neck strength increased 50 to 60%.

3. ELIMINATION OF COMPLICATED LUBRICATING SYSTEMS that hamper roll changing. No pipes, tubes, etc. Timken bearings permit use of simple, economical grease lubrication. Rolls can be changed easier and in less time.

4. LOAD RATINGS INCREASED UP TO 40% due to Timken's balanced proportion design.

5. NO SPECIAL THRUST BEARINGS NEEDED. Timken tapered roller bearings take both radial and thrust loads in any combination.

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Like many other firms this one had been using a wide variety of costly grades, some of which were not altogether essential or justified. This may not be the situation in your plant, but we suggest you have your steel needs reviewed periodically so as to hold the grades to the minimum.

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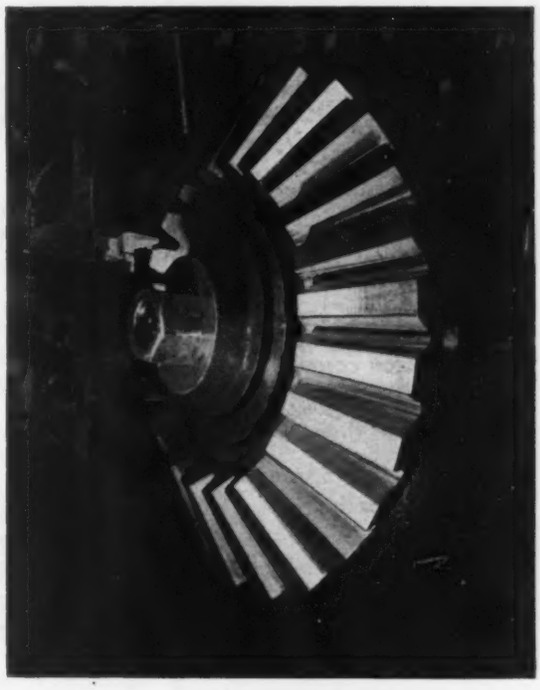

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THE IRON AGE

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MARCH 2, 1950 • • • VOL. 165, NO. 9

Special Article

The first eyewitness account of U. S. Steel's fabulous ore discovery in Venezuela is a story of the energy, perseverance and vision of many men. To get it Tom Campbell flew 5500 miles, covered the ground by jeep and talked to the men on the spot. It is the human story of a strategic operation.—p. 75.

Issue Highlights

Casting the 30-ton engine block for a gas-diesel engine as big as the largest available railroad flatcar could handle —and doing it on a production basis—presented some problems. Particularly when the foundry had to gear for 6 to 8 a month. The production job can be done in 2 days now.—p. 81.

Armco has introduced two new stainless steels that employ copper and aluminum as precipitation-hardening elements instead of carbide formers previously used. They have excellent corrosion resistance and high strength which open new applications.—p. 86.

American steel companies have run into sharp price competition from abroad and have also felt the effects of devaluation. This is no surprise. Before the war they did a bit of price cutting themselves and may have to do some again some day.—p. 115.

The railroads are proposing "substantial reductions" on iron and steel freight rates to get back some of the business they have lost to trucks. One change would apply the 80,000-lb minimum carload rate in Eastern Territory.—p. 117.

Malleable iron business is reported picking up after its bad slump during the second half of last year. Prices are firm but competition is reported rugged. The industry would like to use all of its million ton capacity but it is doubtful if that will be accomplished this year.—p. 121.

Coming Next Week

How to choose the correct lubricant for drawing wire is complicated by the various types available. A practical article will be published next week, outlining the die lubricants for high and low carbon and stainless steels, aluminum, copper and bronze. It tells when to use wet and dry lubricants, soaps, emulsions, etc.

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Editorial

INDUSTRY VIEWPOINTS

Friends Are Friends

WE favor one objective of the Economic Cooperation Administration. We feel communism should be kept in check. And we think that a good job has been done in Europe. We think too that there is still work to be done there.

But we also think that we have friends to the south of us who need help too. People who helped us in the last war. People who have our confidence and we theirs. People who have not been too much of a bother when it came to asking for money.

One country which stands out in that respect is Venezuela. A country that has yet to default on its external debts. A country that supplied us with oil when we needed it. A country that has no suspicions against the United States of America. A country whose people buy so much from us with the dollars they get for the oil that they are one of our best customers.

A people who want to do the things we do. Have the things we have. A people who have given wholehearted support to oil companies from this country. A people who have been nothing but cooperative toward U. S. Steel and Bethlehem in the big iron ore discovery down there. A people who want not our money but our know how.

How do I know these things? I just came from there. The time I spent was not in a drawing room with people who might have had a prepared story. I talked to government officials, oil presidents, ore people, storekeepers, lawyers, prospectors, drillers, dock workers, engineers, shoe shine boys and people in almost every walk of life.

I found a growing nation that wants and needs our help. But not in money, except for American business men to invest in plant and property in Venezuela. The Venezuelans are scared stiff because their economy is almost 90 pct in oil. They fear the time may come when a catastrophe might occur because of that dependence.

They want to expand. They want new industries. Their appetites are whetted by the American goods they have bought and consumed. They have provided a lot of American dollars so that France and other European countries could buy from us.

But they want more. They want to diversify quickly. They want a big iron ore industry down there. They want to keep oil too. But they want other industries. They are looking to American business men to help them with technical details and investment. And they are sincere. They are friendly. They are not suspicious of us. They want help. Point Four could very well start among our closest friends. We may need them badly some time not too far in the future.

Tom C. Campbell

Editor

Why Bundyweld is

When there's even a hint that your product, design or production problem calls for a tubing, think of Bundyweld Tubing!

However you use it—in a design, structural or functional application—Bundyweld delivers all-round rugged, long-lived, *dependable* performance through thick and thin, heat and cold, stress and strain.

In short, no other tubing can match all Bundyweld's advantages, for no other tubing is made like Bundyweld . . . as witness below.

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Every automobile produced today contains an average of 20 parts of Bundyweld. More, Bundyweld is in the hydraulic brake line systems of 95% of today's cars! If strength and high resistance to vibration fatigue are *the* factors in your tubing needs, you need Bundyweld.

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Easy-to-handle Bundyweld fabricates like a charm. It bends more readily and takes more bending. It gives you a competitive edge from lowered fabrication costs, whether you're concerned with beer coils, tubular frames, radiant heating systems, or just a "gimmick" made from a tubing.

First, a single strip of basic metal, coated with a bonding metal, is . . . rolled twice around into a tube of uniform thickness, then . . . passed through a furnace. Bonding metal fuses with basic metal, presto— Bundyweld . . . double-walled and brazed through 360° of wall contact.

NEWSFRONT

NEWS, METHODS AND PRODUCT FORECAST

► Scientists of the National Bureau of Standards have completed work that may provide a way of getting extremely low temperatures. Helium II is passed through an opening less than 1/100,000 in. in diam., leaving behind the atoms of one of the two fluids of which it is composed. According to the Bureau's theory, superfluid atoms pass through the hole but take no heat with them.

This opens the possibility of getting lower temperatures on one side of the opening. They are now well within one degree of absolute zero but may get closer by this technique.

► Current business optimism of auto industry executives is being reinforced by the remarkable success of the Chicago auto show. Attendance has broken records and the crowds are in a buying mood. Sales of cars and trucks at the show have exceeded expectations.

► A large auto parts producer is commercially plating chromium directly on stainless steel grilles, parts of which were formed after polishing the steel in flat strip form.

► Second half business depends a lot on whether or not business gets sales conscious. A high government official who has reviewed some typical advertising and sales budgets says he's not sure this consciousness has seeped in yet. This man is a friend of business and a Republican.

► The Army Engineers report that they have discovered fire extinguishers twice as effective as ordinary agents. They recently tested a series of compounds in the bromofluorocarbon group and reportedly did a far better job than the commercial products, but have not yet run toxicity tests on the new products.

► In the battle of the automatic transmissions, chances are that neither the Hydra-Matic nor the torque converter will win. The final device will probably be a combination of the two, minimizing the present deficiencies of each design.

► It looks as though foreign steel is now being sold in the U. S. at a loss. American steel is not going overseas at a loss today but it's a fair bet that if domestic demand falls off sharply some U. S. firms may "dump" in the export field to keep their markets and hold up operating rates.

► Philippine importers, strangling under import controls, are considering establishment of more local industries. One syndicate is inquiring for equipment to make wire nails, barbed wire, roofing nails, and possibly poultry wire and fencing. Local labor and capital would be used.

► A Canadian smelting company is considering building a 280-ft ore roasting furnace stack of aluminum--one of the largest of such structures ever erected. The company replaced the top 20 ft of a smaller brick and mortar stack with aluminum, with indications that the aluminum had better resistance to the corrosive gases, was cheaper to build and easier to maintain.

► The Detroit battle of cast vs. stamped parts for automatic transmissions is getting hotter since recent casting developments put that method back into the contest. Pattern changes cost less than die changes but it is argued that high volume production will make stamped assemblies cost less.

Are you using this helpful tool?...

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Steel Makers Gambled and Lost

Gray Market is Reported Back

The Iron Age SUMMARY

IRON AND STEEL INDUSTRY TRENDS

STEEL producers this week are surrendering grudgingly, though inevitably, to the coal shortage. Steelmaking operations are scheduled at 70 pct of capacity, down 18½ points from last week's rate of 88.5 pct. Even this rate is tentative. It will be revised sharply downward if no coal is mined again this week.

But this tells only part of the story. Production of coke and pig iron have been cut back far more drastically than steelmaking. Another week of these reduced operations will bring the ingot rate down with a bang. This will be a bitter pill for steelmakers to swallow.

They have gambled that the coal-labor crisis would be resolved before their operations were greatly affected. They have held production at a high level despite their rapidly disappearing coal stocks. Although their policy in the past had been to bank furnaces when coal stocks were reduced to about two weeks' supply, some companies, this time, have already extended themselves beyond that danger point.

Charging More Scrap in Openhearths

At the same time steelmakers have kept their operations at a high level, they have been reaching out for very ton of coal they could get their hands on. Much of this has been expensive and of poor quality, resulting in higher costs.

Most steelmakers have greatly increased the proportion of scrap steel being charged into their openhearth furnaces. This partly explains why some companies which have cut coke making and blast furnace operations to a mere 25 pct of capacity have still been able to keep their steelmaking rate near 75 pct of capacity. But there is a limit to how far their ingenuity can be stretched. For most companies it will be reached this week.

The shutdowns will naturally aggravate the current strong demand for steel products. Steel men generally had expected demand to continue strong through the second quarter—if they were allowed to continue operating at a high rate. But the feeling now is that the clamor for steel will be extended into the third quarter. The cry for steel is expected to be out of proportion to the amount of production which is lost.

Conversion, Gray Market Return

This week the steel market is reflecting familiar characteristics of former times. Demand is at a very high level. Conversion activity is increasing rapidly. And the gray market is returning, on a limited scale. The return of the gray market is being prompted by steel consumers who have juicy orders for their products but who have been unable to get harried steel producers to promise delivery of the material they need.

So far, most conversion arrangements have been going pretty well on schedule. This week the pressure from this direction is being accelerated by the efforts of one big steel consumer to buy up all available ingots. Much of this tonnage could be converted into usable steel items even if the coal crisis continues.

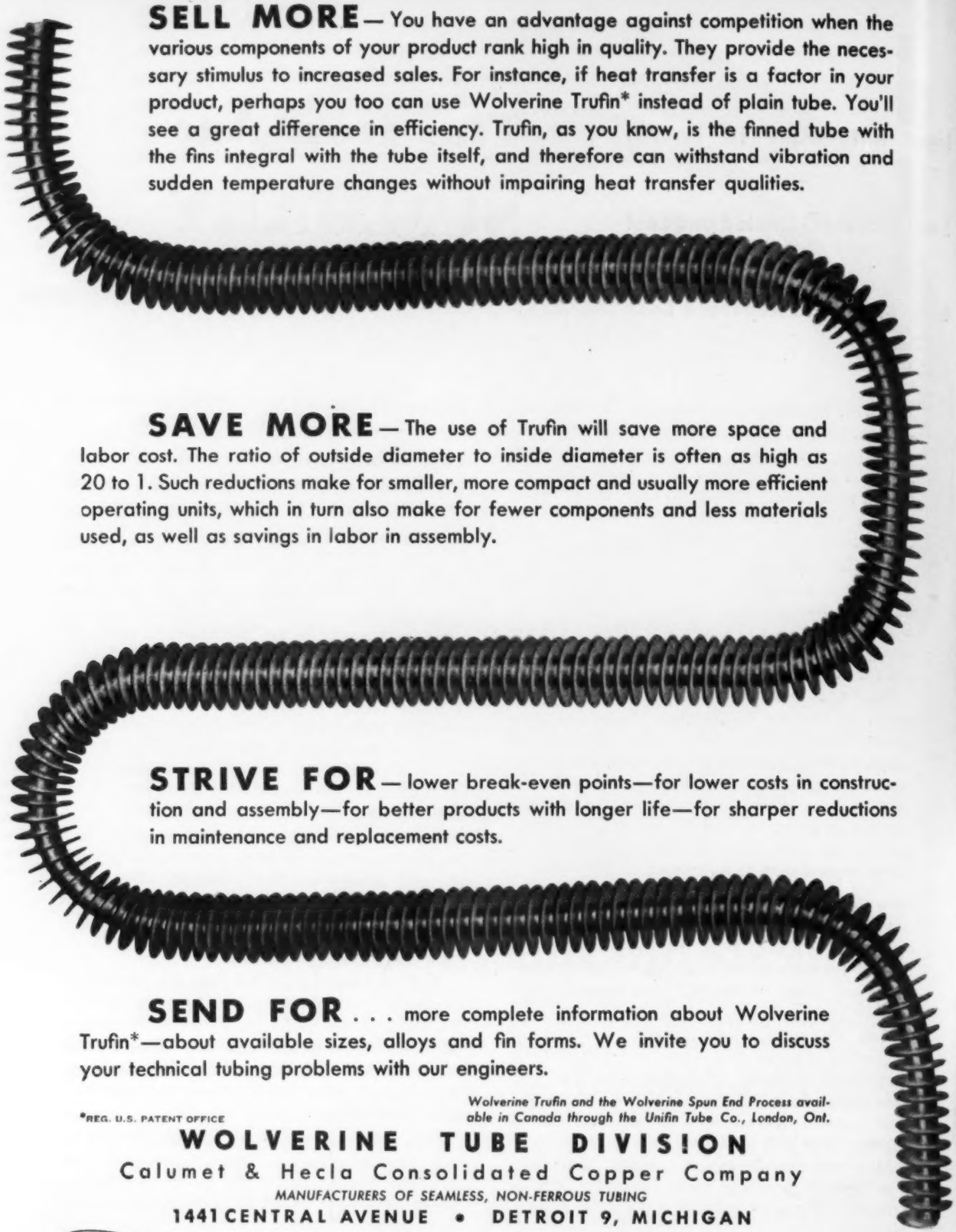
No matter how the coal crisis is resolved, it appears that there are hard times ahead for both the coal miners and the operators. Sources in industry are repeating more often and more loudly that "this industry is sick."

Coal Seen Losing Markets

Coal consumption has been steadily decreasing, while use of oil and gas has been increasing. On the basis of the coal tonnage which can be expected to be consumed this year there are too many miners—they might have work for about three days a week, after exhausted stocks have been replenished.

High prices are one of the big reasons why the coal industry is sick. Higher wages are a contributing factor. But so are increased transportation costs, which must be figured in the cost to the consumer. There are more and bigger things than higher wages and more paid holidays for John L. Lewis and the operators to talk about. They might talk about the industry's future.

The scrap market was generally quiet. But at Pittsburgh a $1 a ton decrease in No. 1 heavy melting steel lowered THE IRON AGE steel scrap composite 34¢ a ton to $27.08 per gross ton.



SELL MORE— You have an advantage against competition when the various components of your product rank high in quality. They provide the necessary stimulus to increased sales. For instance, if heat transfer is a factor in your product, perhaps you too can use Wolverine Trufin* instead of plain tube. You'll see a great difference in efficiency. Trufin, as you know, is the finned tube with the fins integral with the tube itself, and therefore can withstand vibration and sudden temperature changes without impairing heat transfer qualities.

SAVE MORE— The use of Trufin will save more space and labor cost. The ratio of outside diameter to inside diameter is often as high as 20 to 1. Such reductions make for smaller, more compact and usually more efficient operating units, which in turn also make for fewer components and less materials used, as well as savings in labor in assembly.

STRIVE FOR— lower break-even points—for lower costs in construction and assembly—for better products with longer life—for sharper reductions in maintenance and replacement costs.

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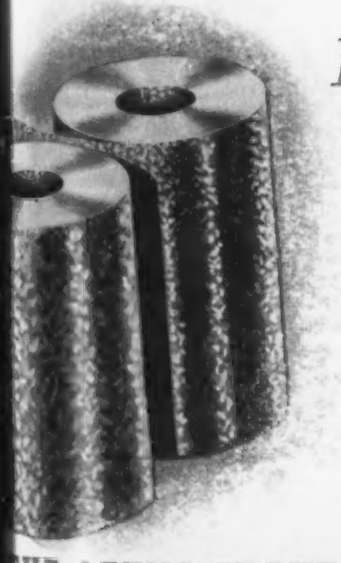

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Fatigue Cracks

By Charles T. Post

Apology to Darwin

The atomic scientists could contain their curiosity no longer. They had assembled the first H-bomb. By every calculation, it should assure the ultimate in devastation. So they sneaked it off to an isolated island, and set it off.

The bomb worked only too well. In a matter of seconds civilization was a cipher. Mankind and all of his pretentious works and petty discussions were obliterated. The hot winds seared the south Aziatic jungles, stripping the foilage and scorching the animals. Two little monkeys huddled in a shielding cave paused in their lovemaking.

As the holocaust subsided, the male monkey turned to his mate and cocked his head.

"Well, Mona," he sighed, "it looks like we'll have to start the whole thing from scratch all over again."

Efficiency

The proponents of socialized medicine would have us understand that its operation in the United States will be marred by none of the jarring confusion that has caused such inefficiency in Great Britain.

The patient who entered a test clinic in Washington encountered no receptionist, but only two signs pointing to opposite corridors: "Upper or lower?" they queried. Since his complaint was in the lower portion of his anatomy, he chose the "lower" corridor. Next he encountered branching corridors marked "right" and "left," and took the right. At the next fork, the choice was "front" or "back." He turned down the "back" hall, only to bump into a "Republican or Democrat?" crossroads. He took the course marked "Republican" and soon found himself back on the street.

Faithful Employee

R. W. Deimel considered the Fatigue Cracks item (Feb. 9) about the Illinois kiln tender who had worked 7 days a week for 41 years without vacation. Then he dusted off the railroad classic:

Deciding to seek out and reward the railroad's most efficient employee, the new president ordered the records searched for the worker with the best attendance record. Soon the search turned up a man in an outlying freight yard who had not missed an hour's work in over 30 years. The president called him before the board of directors to present a gold watch.

"So you have not missed an hour's work in 30 years, Jim?" the president queried.

"No, sir."

"And just what is your work at the freight yard?"

"Sir, when those long freight trains pull in, I take a hammer with a long handle, and I knock at every axle."

"Well, what do you do that for, Jim?"

Jim twisted his cap, and scratched his head. "How the devil should I know, sir?" he replied.

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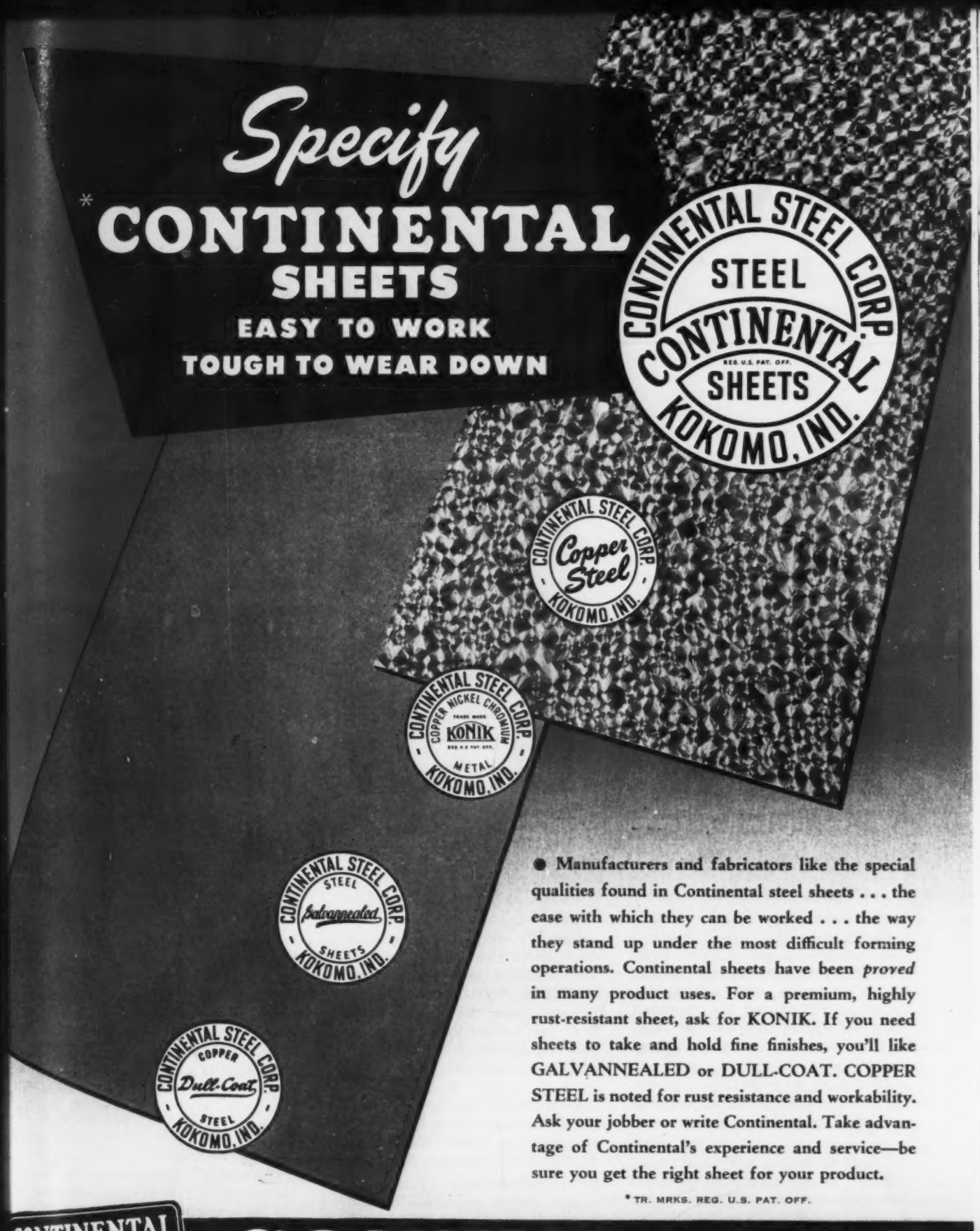


● Manufacturers and fabricators like the special qualities found in Continental steel sheets . . . the ease with which they can be worked . . . the way they stand up under the most difficult forming operations. Continental sheets have been *proved* in many product uses. For a premium, highly rust-resistant sheet, ask for KONIK. If you need sheets to take and hold fine finishes, you'll like GALVANNEALED or DULL-COAT. COPPER STEEL is noted for rust resistance and workability. Ask your jobber or write Continental. Take advantage of Continental's experience and service—be sure you get the right sheet for your product.

* TR. MRKS. REG. U.S. PAT. OFF.

CONTINENTAL
STEEL CORPORATION

GENERAL OFFICES • KOKOMO, INDIANA

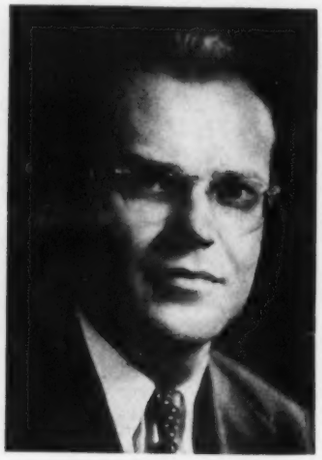
ODUCERS OF *Steel Sheets*, includ- Continental GALVANIZED, KONIK d COPPER-STEEL culvert sheets.

COPPER-STEEL Galvanized, KONIK steel sheets Galvanized, DULL COAT, Continental GALVANNEALED, ELECTRICAL, Hot Rolled Pickled.

ALSO, Manufacturer's Wire in many sizes, shapes, tempers, and finishes, Continental Chain Link Fence, Nails, and other steel products.

Iron Age *Introduces*

LUDWIG EMDE, president and general manager, Temprite Products Corp.



ROBERT F. DICK, administrative assistant to vice president and treasurer, Illinois Tool Works.

EDWIN F. BLAIR, a director of the Packard Motor Car Co.

Ludwig Emde was elected president and general manager of TEMPRITE PRODUCTS CORP., Detroit, succeeding **W. R. Clark,** who will become chairman of the board. Mr. Emde left WORTHINGTON PUMP & MACHINERY CORP. five years ago to join Temprite as vice president and general manager and has been directing the company's expansion program since that date.

Frank E. Bodine has been named assistant central station manager for the Pacific Coast district of the WESTINGHOUSE ELECTRIC CORP., with headquarters at San Francisco. Former Pacific Coast manager of maintenance sales, Mr. Bodine will serve the company's electric utility customers throughout the Pacific Coast district in his new capacity.

Robert F. Dick became administrative assistant to **Calmer L. Johnson,** vice president and treasurer of the ILLINOIS TOOL WORKS, Chicago. Before joining the organization, Mr. Dick was for ten years a vice president of GEORGE FRY & ASSOCIATES, Chicago and New Fork.

R. M. Junker was appointed manager of the industrial roll sales department of the GOODYEAR TIRE & RUBBER CO., replacing **Ernest Peterson** who has retired.

John H. Elliott was named assistant general manager of operations of CARNEGIE - ILLINOIS STEEL CORP. At the same time, **Arno L. Billeter** was made general superintendent of the company's Irvin works, near Dravosburg, Pa., succeeding Mr. Elliott.

Edwin F. Blair, New York attorney, has been elected a director of the PACKARD MOTOR CAR CO., Detroit. He fills the vacancy caused by the recent retirement of **George T. Christopher.** A member of the law firm of Blair and Ogden, New York, Mr. Blair is a director of the UNION BAG & PAPER CORP., HOLLY SUGAR CORP. and the T. A. D. JONES CO.

Robert N. Hendrickson has been promoted to vice president in charge of sales engineering of HUCK MFG. CO., Detroit. **Frank A. Dobbe** becomes vice president in charge of sales. Mr. Dobbe was formerly manager of sales for SOUTH CHESTER CORP., and served as a Major in the U. S. Marine Corps during World War II.

UNIVERSITY OF MICHIGAN LIBRARIES

F. R. BURNETTE, assistant vice president of engineering, United States Steel Corp.

F. R. Burnette has been appointed assistant vice president of engineering for UNITED STATES STEEL CORP., Delaware. In this newly created position, Mr. Burnette will have special duties in connection with the future construction programs of the organization.

Mrs. Samuel Maryn became the president of the UNITED IRON & METAL CO., Pittsburgh, following the death of Samuel Maryn, former president.

H. F. (Skip) Lefferty was made Pacific Coast sales manager of the BABCOCK & WILCOX TUBE CO. Mr. Lefferty succeeds **H. P. Curtis** who has resigned to enter other activities.

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Iron Age Salutes

HARRIE S. TAYLOR

HARRIE S. TAYLOR, energetic, young looking president of Oglebay Norton & Co., was born in 1894—the year when the well-known firm he now heads was moving the first shipments of iron ore from the famous Mesabi Range.

The story of his rise from the lowliest jobs to the head of a great company is one of self-help in the finest tradition of a free economy. It proves again the point that you don't have to go back a century or more to find success stories. They are all about you.

After a few years in his birthplace of Chautauqua, N. Y., Harrie's family moved to western Pennsylvania, where he received most of his education—from a one-room country school in Crawford County to an A. B. degree at Allegheny College in Meadville, Pa.

In order to pay for his college education, he waited on tables and handled a laundry route during the school year. During summer months he worked for the Erie R.R.

In 1916 he enrolled at Western Reserve University, Cleveland, for graduate study in law, but his studies were interrupted by World War I. He returned to school after the armistice and received his law degree in 1921.

Soon after being admitted to the Bar of Ohio, he joined one of Cleveland's leading law firms of that day—Goulder, White & Garry. This proved to be one of the turning points in his career. Iron ore, coal and lake shipping companies were among the clients of this firm, and in his 15 years of law practice he gained invaluable experience for his present position.

He became general counsel for Oglebay Norton & Co. in 1936. In 1940 he took on the added duties of general manager of the company's coal and iron ore mining operations. In February 1949, he was made vice-president and 5 months later was elected president when the late Crispin Oglebay became chairman of the board and R. C. Norton, vice-chairman.

Despite his active business career, he finds time to practice several hobbies at his home in Shaker Heights, Ohio. Among his favorites are hunting, fishing, gardening, golfing and last but not least a Shaker Heights square dancing group.

His philosophy is that accomplishment can only be attained by serious, diligent effort.

Exide-Ironclad Batteries

are different..

The different EXCLUSIVE Positive Plate showing slotted tube construction.

Enlarged cutaway view of section of tube containing active material. So small are the slots that, while permitting easy access of electrolyte, they retard the active material from readily washing out or jarring loose.

UNIVERSITY OF MICHIGAN LIBRARIES

What have you got in that can—GOLD?

Sure the cost of a gallon of Barreled Sunlight paint is high. And for a sound, simple reason.

The cost of a gallon of Barreled Sunlight paint is high because it is so loaded with paint quality that it *actually costs less to use.*

You can prove this yourself.

Take a gallon of Barreled Sunlight and compare it with a gallon of any other paint. Thin each according to directions on the can and try them on a wall. Measure the yardage you get from each. Compare the final results in brightness and thorough coverage. Most of all, if you're truly price conscious, clock the painting time for each paint...for labor time today represents 80% of the cost of any painting job.

Once you've made a practical, fact-revealing test you'll readily realize that Barreled Sunlight isn't gold . . . it's *paint*. You'll find that it isn't high in cost, but rather the *lowest-cost paint you can use* for a high-quality job.

Let our representative show you how true this Barreled Sunlight quality is. Write and he'll call.

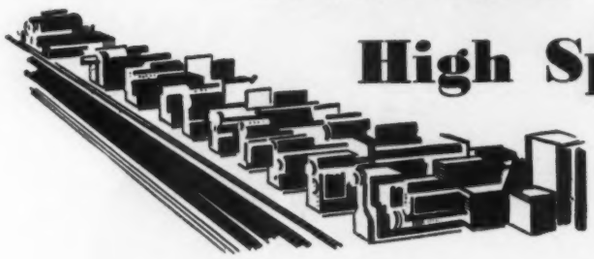
U. S. GUTTA PERCHA PAINT COMPANY
11-C Dudley St., Providence, R. I.

Barreled Sunlight *Paints*

In whitest white or clean, clear, pleasing colors, there's a Barreled Sunlight Paint for every job

IT ALWAYS COSTS MORE NOT TO PAINT!

MACHINE TOOL High Spots



Sales Inquiries and Production

Machine tool replacement market up . . . Car makers increase tool orders . . . Foreign Competition stronger.

by William A. Lloyd

Cleveland—Machine tool builders' highest monthly order volume since the Fall of 1946 was reported this week in Cleveland by National Machine Tool Builders' Assn. Preliminary index of new orders for January is 99.7, compared to 82.5 for December and 87 for January, 1949.

Preliminary index of January foreign orders, which is included in the total, is 26.7, compared to 22.4 for December and 21.9 for January, 1949.

Machine Tool Orders Continue

NMTBA's index of January shipments is 52.4 compared to 75.7 for December and 68.8 for January, 1949.

Ratio of unfilled orders to shipments is 5.7 to 1, compared to 3.4 to 1 for December and 4.6 to 1 for January, 1949.

Base of the NMTBA index is based on average shipments for 1945-1947, inclusive, taken as 100 pct.

Reports from widely diversified segments of the trade indicate that sales engineering departments are busier than they have been at any time since the end of the war. Some observers take this as evidence that machine tool orders will continue at approximately the present high level until well into the second quarter.

In Detroit, orders from Ford, Chrysler-Jefferson, GM Transmission division, Studebaker and others are continuing to come in to increase an already substantial volume of business placed by the car manufacturers since the start of the year.

Additional placements for Chrysler-Jefferson are reported this week and some tool room buying by DeSoto has been indicated, according to trade sources. Additional ordering by Ford for both the automatic transmission and the Monroe die casting operation have been booked. Additional shipments of aluminum die casting equipment have taken place, it is reported, and some important developments in new zinc die casting equipment are anticipated.

Studebaker's Program Picks Up

Meanwhile, ordering for the Ford 6-cylinder engine to be built in Cleveland continues and the best indications are that quotations of the new V-8 will follow in the near future. Further buying by GM Transmission division has been indicated; much of this equipment is to be standard, it is believed.

The program for Studebaker's new engine is slowly gathering momentum, it is indicated.

Over and above the buying of standard and special machines for the car producers, there has been a considerable volume reported for tool rooms both in large and small plants in the Detroit area.

In other markets, the volume of inquiries and quotations suggests to some observers that the prospects for the sale of machine tools in the replacement market were never brighter than they are today. Only about 2 pct of the nation's metalworking equipment is replaced every year.

Foreign business promises to continue substantially at present levels until July 1, end of ECA's fiscal year. Funds have already been allocated.

On the other hand, there is some evidence that Italian buyers are wavering in the general direction of the British machines, as a result of price differentials. Also, the Italians are building up a machine tool industry of their own, duplicating to a considerable extent U. S. machines.

Business in Sweden, according to informed sources, has dried up temporarily, but the machine tool market in Switzerland appears promising.

Monarch Pres. to Tour Europe

Evidence of the competition in European markets at the present time can be had from the fact that certain machine tool builders are now shipping on consignment.

Some companies will exhibit at the German machine tool show in Hanover, May 3 to 14, and at the Milan show, April 12 to 20.

In Sidney, Ohio, Monarch Machine Tool Co. reported current assets of $5,056,588 or more than 20 times current liabilities of $242,186. Jerome A. Raterman, president, reported preliminary net profit for 1949 of $557,286, compared to 1948 net of $639,822. Sales for 1949 totaled $7,163,630. Mr. Raterman will spend three months abroad examining first hand the problems and prospects of selling machine tools in the European market.

UNIVERSITY OF MICHIGAN LIBRARIES

SEE WHAT SIMONDS offers in these famous "RED END" Hack Saw Blades

ACCURATELY MILLED TEETH

Simonds Design Tooth Shape, maintained by accurate milling, provides perfectly formed teeth of exact height. This distributes wear evenly to all teeth with resultant longer cutting life.

PRECISION SET TEETH

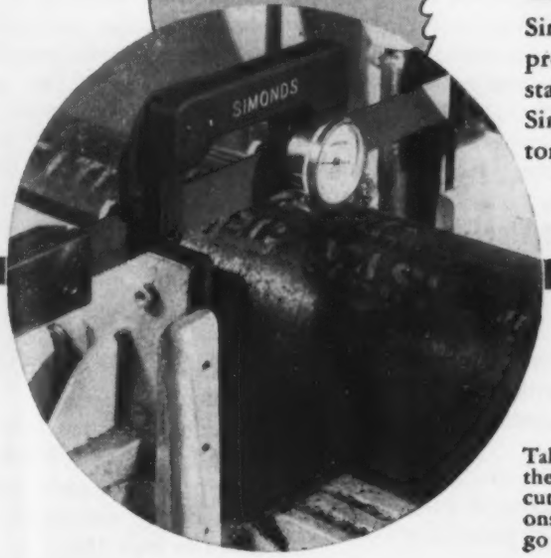
Machines of advanced design set the teeth to exacting tolerances. This not only provides adequate clearance but results in straighter cuts throughout the life of the blade.

UNIFORM HARDNESS

Simonds Method of Heat Treating produces uniform hardness throughout the length of the blade unapproached by conventional heat treating methods. As a result, there is no variation in the grain structure of the steel and the teeth hold a cutting edge longer. This means consistently better cutting performance and low cutting costs.

A "RIGHT" BLADE FOR EVERY NEED

Simonds High Speed, Molybdenum, and Standard Steel Blades provide a "right" blade for every job — hand or power. All standard sizes are available from stock through your local Simonds Distributor. Consult the Classified Telephone Directory under "SAWS" or write the nearest Simonds Branch.



SIMONDS
SAW AND STEEL CO.

FITCHBURG, MASS.

Branch Offices in Boston, Chicago, San Francisco and Portland, Ore.
Canadian Factory in Montreal, Que.

Take the guesswork out of hack saw tensioning with a SIMOMETER—the easy, modern way to insure correct blade tension and get straight cuts, faster cuts and more cuts per blade. Ask for a SIMOMETER demonstration and see for yourself how it can make your hack saw dollars go farther.

GLOBAL LETTER

REVIEW OF WORLD MARKETS

Automobile workers in Paris area strike for more wages and increased benefits . . . Belgian steel plant modernized by ECA funds . . . Sweden increases U. S. imports.

Paris — A major labor crisis threatened the Parisian industrial area last week as thousands of automobile workers left their jobs in an effort to obtain higher wages and increased benefits. As a result, the possibility of another nationwide strike loomed on the French industrial horizon.

The Renault automobile factory near Paris ceased operations when 80 pct of the 200,000 workers employed in the plant voted for a strike of unlimited duration. It was expected that 3,000 office employees would follow the action of the factory workers. The strike is being sponsored by the Communist-led General Confederation of Labor, the non-Communist Workers' Strength, the French Confederation of Christian Workers and an independent union.

Earlier in the month workers at the Ford plant at Poissy voted 3117 to 1383 to go out on strike. Production also halted at Ford's Rosengart factory and a strike vote taken at the Hotchkiss plants.

Leaders Plan Further Action

Union leaders are planning to undertake similar action in the entire automobile and metal-working industry in the Paris area. If such strikes are called they would involve an estimated 200,000 workers.

The passage this month of the first free collective bargaining law since the end of the war by the French Assembly made the possibility of future and more widespread strikes seem likely, as labor and management are preparing for a test of strength.

Both labor and management appear confident of victory in the Paris strikes but it is known that the unions are not as strong here as in the United States. For this reason some industry leaders seem unconcerned about the outcome.

ECA Funds Modernize Steel Mill

Brussels—Installation of a semi-continuous hot strip steel mill at Ougree, Belgium, for S.A. Ougree-Marihaye, as one step in modernizing its rolling equipment, has been approved by the Economic Cooperation Administration.

The over-all cost of the project is estimated at the equivalent of $16,800,000. Equipment to be purchased in the United States will require ECA financing of $7,650,000.

The 66-inch hot mill will include a four-high rolling mill and four stand finishing equipment. It will produce approximately 378,000 metric tons of plates and sheets per year. Plates, which will represent about 24 pct of the hot mill's production, will be rolled on the four-high mill.

Rolling Equipment Modernized

The purpose of this project is modernization of rolling equipment rather than expansion of production. When completed, 48,600 metric tons of flat products will be produced each month. This tonnage is equivalent to that available from existing equipment for rolling flat products. However, the existing capacity includes 33,000 tons per month of strip tonnage, made up of narrow strip from a 10-inch mill and other strip from old merchant mills. After installation of the 66-inch hot mill, the production will include 16,000 tons per month of wide sheets in coils and 17,000 tons of strips. Monthly plate tonnage of 7600 metric tons and hot rolled sheet tonnages of 8000 metric tons will be unchanged.

Ougree-Marihaye is the largest iron and steel plant in Belgium producing 90 pct of the strip made in that country. It specializes in

Turn to page 186

They put the "squeeze" on this unretouched sample of Armco Tubing shown at the right. Originally an exact duplicate of the section of tubing at the left, it was compressed into an accordian-like fold on a testing machine. Not a crack or break can be found—either in the tube wall or in the butt-weld.

See for yourself how this steel tubing TAKES SEVERE FORMING

This tough test gives you a good idea of the excellent fabricating qualities of Armco Steel Mechanical Tubing. You can depend on it to meet practically all kinds of bending, flanging, expanding, beading, upsetting and swaging operations.

And with these fabricating advantages, Armco Steel Mechanical Tubing offers your products light weight with high strength at low cost. Under many types of loading conditions tubular parts give your products the most efficient section for light structural requirements. Tubing is pleasing to the eye too—helps you design products that are more attractive, more saleable.

Many manufacturers have found it worthwhile to look into the advantages of this electric resistance welded steel tubing. It is available in sizes ranging from ¼" to 3" O.D., and wall thickness ranges from .028 to .083". (Some sizes cannot be supplied in all wall thicknesses in these ranges.)

If you now use tubing, or if your products can be adapted to the use of Armco Tubing, get a free sample for fabricating tests in your own shop. Just fill in the handy coupon, attach it to your company-letterhead please, and mail it today.

MAIL THIS HANDY COUPON NOW

ARMCO STEEL CORPORATION
3790 CURTIS STREET, MIDDLETOWN, OHIO

Send me a free sample of Armco Tubing. Size required:

O. D. _____ Wall thickness _____

We manufacture _____

Name _____ Title _____

Company _____

Street _____

City _____ Zone _____ State _____

ARMCO STEEL CORPORATION

3790 CURTIS STREET, MIDDLETOWN, OHIO • PLANTS AND SALES OFFICES FROM COAST TO COAST • THE ARMCO INTERNATIONAL CORPORATION, WORLD-WIDE

FREE USE POST CARD

PUBLICATIONS

New publications that describe money saving equipment and services are available free and without obligation. Copies can be obtained by filling in the attached card and mailing it.

Deferred Payment Plan

How Bliss power presses may be purchased under a deferred payment plan is described in detail in a 4-p. folder giving examples of 6 plans, ranging from 12 to 36 months. How monthly payments and interest charges are calculated is shown. *E. W. Bliss Co. For more information, check No. 1 on the postcard.*

Rust Protection

A new 16-p. booklet describes Oakite Special Protective Oil for rust prevention, and specifies strategic points where it may be applied most effectively in production processes, in addition to presenting data on efficient anti-rust procedures. *Oakite Products, Inc. For more information, check No. 2 on the postcard.*

Mineral Wool

How to apply mineral wool insulation to all types of flat or curved surfaces encountered in high-temperature installations on sheet metal and brick surfaces is explained in a 36-p. standard prepared by the National Bureau of Standards. *Industrial Mineral Wool Institute. For more information, check No. 3 on the postcard.*

Cutting Tools

A new 136-p. illustrated catalog lists and describes all Continental standard carbide and high-speed steel cutting tools, shows many special tools and contains a complete broach and fixture section, in addition to useful information and charts used by the metalworking industries. *Ex-Cell-O Corp. For more information, check No. 4 on the postcard.*

Structural Steel

Technical data for the installation of Junior Beams, along with illustrations showing floor joist and roof purlin installations in progress, is presented in a new 24-p. booklet describing these lightweight hot-rolled steel beams. *Jones & Laughlin Steel Corp. For more information, check No. 5 on the postcard.*

Power Transformers

Various steps in the manufacture of small power transformers are described in a new 28-p. bulletin covering single phase transformers, 69,000 v and below—up to 5000 kva inclusive, and 3-phase transformers, 69,000 v and below—up to 15,000 kva inclusive, with tables of preferred voltage ratings for step-down power transformers. *Allis-Chalmers Mfg. Co. For more information, check No. 6 on the postcard.*

Speed Reducers

Complete descriptions of standard IMO—De Laval horizontal worm gear speed reducers are given in a new 28-p. bulletin showing all available types, standard specifications, horsepower ratings, overhung load capacities, dimensions, and information on how to select worm gears. *De Laval Steam Turbine Co. For more information, check No. 7 on the postcard.*

Pulleys and Sheaves

Price reductions in popular size multi-groove split taper bushing V-belt pulleys, ranging from 50¢ to $3.00 per sheave, are announced in the new sheave catalog 1149 and Engineering Data Book 1049. *Rockwood Mfg. Co. For more information, check No. 8 on the postcard.*

Plastic Coating

Gaco vinyl plastic finishes for metal, wood, paper and ceramic surfaces, are described in a 4-p. folder listing the types available for use in industrial, maintenance, marine and aviation applications. *Gates Engineering Co. For more information, check No. 9 on the postcard.*

Bearing Materials

Available stock sizes of solid and cored bars and plates of Wel-Met sintered bearing bronze are listed

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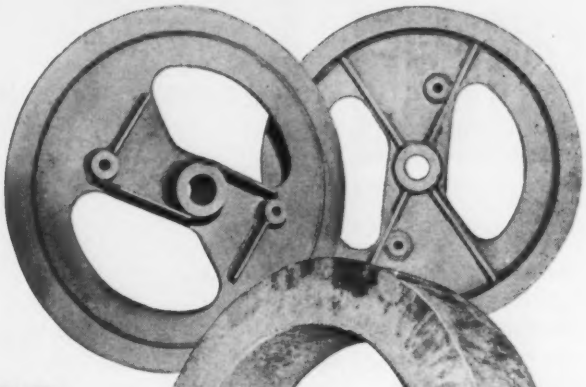

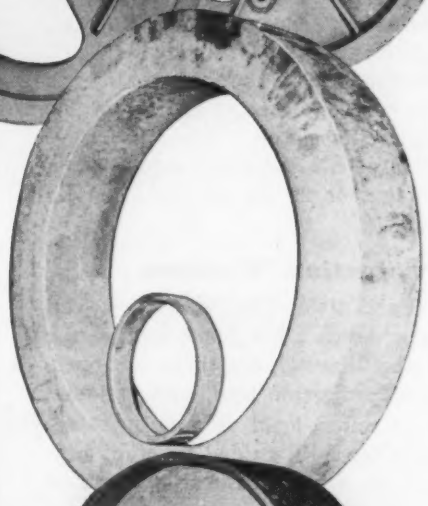

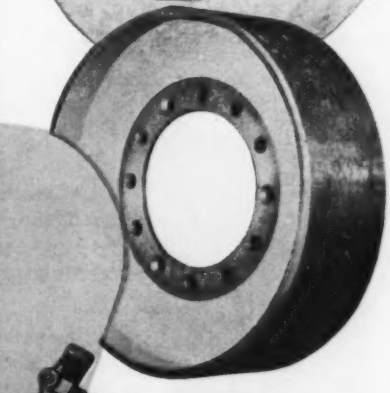

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"Controlled Technique"

can be applied to

Your Products

Fabrication of your products by American Welding will enable you to make better products and with appreciable manufacturing economies!

Our facilities include all types of resistance and fusion welding applicable to both ferrous and non-ferrous metals and alloys in rings, bands and weldments. Heat-treating and machining facilities are available.

Over 32 years of welding and fabricating experience is yours for the asking. Skilled designers, engineers and metallurgists will gladly apply this experience to your requirements without obligation. Send prints and specifications for prompt quotation.

SEND FOR NEW 20-PAGE CATALOG!

THE AMERICAN WELDING & MANUFACTURING CO.

130 DIETZ ROAD • WARREN, OHIO

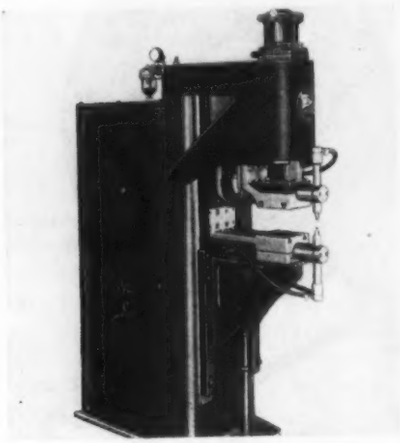
NEW PRODUCTION IDEAS

Continued

parts exposed except the capstan barrel; totally enclosed dirt and weather-proof housing; and a squirrel cage hoist-type high torque, high slip motor. *Silent Hoist & Crane Co. For more information, check No. 29 on the postcard on p. 35.*

Projection Welders

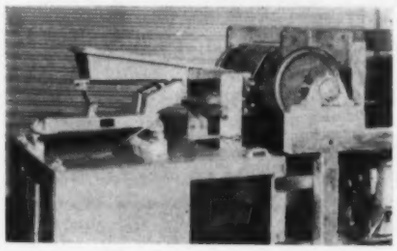
Fast action, accurate work and long service life are claimed for a new line of press type, air-operated projection and spot welders. The roller head is air operated, with the quill guided by eight rollers, mounted on the gib, assuring



rigidity and positive alignment regardless of stroke length. An extra heavy-duty transformer, equipped with an eight-stage series parallel heat selector switch, assures capacity for a wide range of metals. For spot welding, 2¾-in. diam arms, and 1¼-in. diam ejector type holders are provided. *Banner Mfg. Co. For more information, check No. 30 on the postcard on p. 35.*

Agitator Separator

Separating small amounts of nonmagnetic material from large amounts of magnetic material is possible with the new Eriez nonelectric agitator separator. Physical separation by agitation is effected before the material reaches the most powerful areas of the magnetic field. The machine consists of a permanent magnetic pulley with surface of Alnico and nonmagnetic slats. A receiving chute or vibrator tray distributes the material to a nonmagnetic vane assembly from which it passes to the pulley belt. From the vane assembly the magnetic particles jump to the belt and adhere to it until carried out of the



magnetic field, at which point they drop into a receptacle. The nonmagnetic material drops through the vane assembly to its own receptacle. About 90 pct of magnetic material is withdrawn as it reaches the first vane on the feeder. The remaining 10 pct drops through the feeder but passes the lower face of the pulley where it re-enters the magnetic field and virtually completes the separation. *Eriez Mfg. Co. For more information, check No. 31 on the postcard on p. 35.*

Single Spindle Automatic

The new Acme-Gridley Model M single-spindle, automatic bar machine features heavy and sturdy construction; and simplicity and flexibility of tooling. The box-shaped frame is well supported to take the strains from the cross slides, spindle drive and turret, and open tooling permits ease of operation and setup. Three heavy cross slides operate independently and there are five independently cammed end-working slides on the five-sided turret. Threading can be performed with self-opening dies or collapsible taps. The turret is indexed with an independent motor by a Geneva movement in the outer support. Cam controlled clutches automatically provide three spindle speed ranges with each combination of change gears, and spindle speed and feed change gears are interchangeable. Feed control for the main camshaft is by direct drive from the main spindle. Wide open tooling area and chip room are additional features, and a chip conveyer system is optional. Idle time movements operated from the main drive are accomplished by the constant speed shaft driven directly from the pulley shaft and independent of the spindle speed or feed. The machine is built in four bar sizes: 2⅝, 3½, 4¾, and 5⅛ in. *National Acme Co. For more information, check No. 32 on the postcard on p. 35.*

Turn to Page 163

the answer can save you money

on the painting line!

PANEL A was cleaned, rinsed, dried and coated with lacquer. (Clear lacquer was used so that corrosive action could be observed through the coating.) A scratch was cut through the lacquer and the panel was subjected to salt spray testing (ASTM Method B 117). After 144 hours, Panel A was thoroughly corroded; the lacquer had blistered and peeled in every area.

PANEL B was prepared in the same way as Panel A—*in every particular but one.* After 144 hours in the salt spray chamber with Panel A, Panel B showed only faint signs of corrosion in the area of the scratch—plus a few dried-salt stains. There were no signs of corrosion under the lacquer bordering the scratch or at any other part of the panel.

THE ONE DIFFERENCE between the two panels is that Panel A was cleaned with solvent while Panel B was simultaneously cleaned and conditioned for painting by the OAKITE CrysCoat PROCESS, which improves the adhesion of paint to metal and prevents corrosion before and after the metal is painted.

For preparing metal surfaces for painting, there is nothing to equal the

OAKITE CrysCoat PROCESS

MAIL THE COUPON for your FREE copy of an illustrated folder that describes the OAKITE CrysCoat PROCESS, tells how it operates *with minimum equipment, in minimum time* and how it *cuts cost 10 ways* in treating steel, aluminum sheet, aluminum castings, zinc die castings and galvanized surfaces before all types of organic finishing.

*Reg. U.S. Pat. Off.

OAKITE PRODUCTS, INC.
18 Thames Street
New York 6, N. Y.

Please send me folder F7642, describing the OAKITE CrysCoat PROCESS

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COMPANY . . . . . .
ADDRESS . . . . . .

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Technical Service Representatives Located in Principal Cities of United States and Canada

On the ASSEMBLY LINE

AUTOMOTIVE NEWS AND OPINIONS

Auto production lines holding together by a narrow margin . . . Cut in some schedules may come next week . . . Chrysler strike goes into fifth week . . . Ford has big plans for Buffalo.

by Walter G. Patton

Detroit—The strangle-hold John L. Lewis and his miners have on the nation's throat is gradually squeezing the auto industry into complete inactivity.

The present outlook is that all auto producers will continue production through this week. Assuming no agreement is reached between the miners and the operators by the week of Mar. 6 we may see the first shutdown of an auto plant due to lack of coal. The most vulnerable producer at the moment appears to be Packard.

The Ford position is best described as "precarious." A week ago Ford took several important steps to stretch its coal supply lines. By substituting natural gas and fuel oil for gas generated in Rouge operations, Ford coal consumption was cut from a normal 2000 tons a day to about 600 tons per day. All overtime work has been cancelled. Meanwhile steel production in Ford openhearth has been cut back to about 80 pct of normal due to retarded coke oven operations. Up to the present time about 100 Ford employees working on coke ovens and blast furnace operations have been laid off.

The change in fuels will undoubtedly stretch the Ford coal supply somewhat but production schedules will probably go on a day-to-day basis early in March.

No Acute GM Problem

Informed sources believe that GM's coal problem is not acute and that its steel stocks are holding up well. Present indications are that GM should be able to carry on its present production schedules for another two weeks at least.

The Detroit Edison Co. is reported to have sufficient coal to permit production of electricity for another month. Up to the present time, no restrictions on electricity use have been put into effect.

Without any production at Chrysler which remains on strike, Automotive News estimated auto output for the week ended Feb. 24 at 117,500 units. Approximately the same number of assemblies are anticipated during the current week. Some tapering off in auto operations is anticipated the week of Mar. 6 and a critical curtailment in operations could easily come the following week depending upon developments in the coal strike.

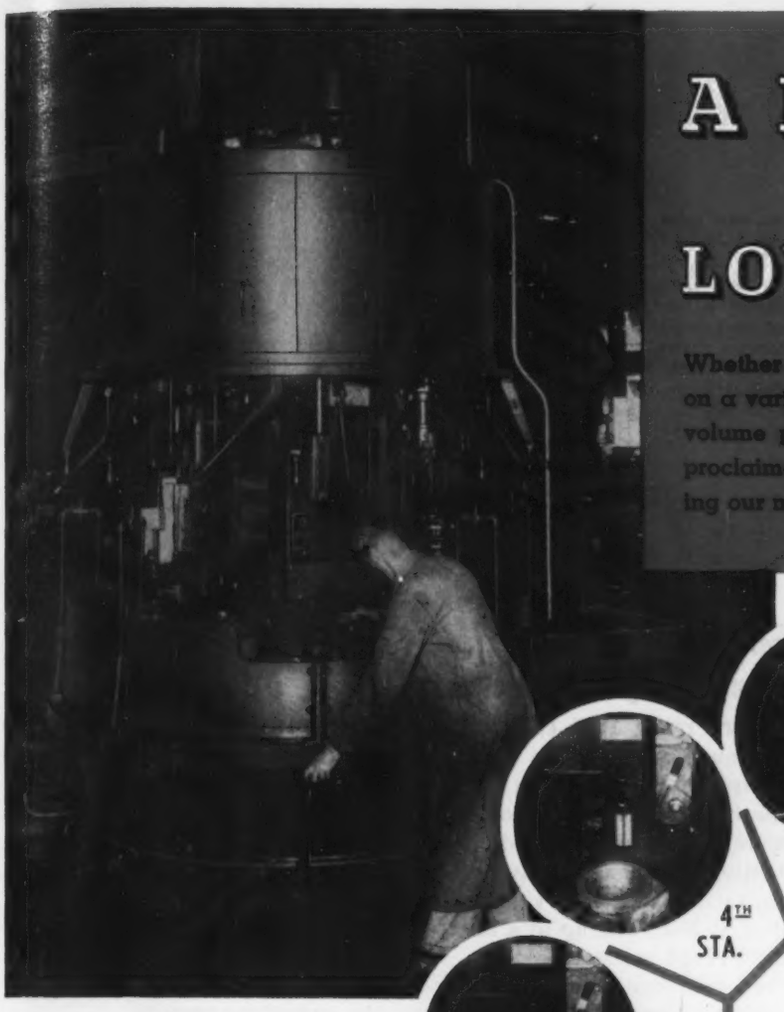
Chrysler, UAW Air Strike Grievances in Detroit Papers

Again this week both Chrysler and the UAW-CIO took full page advertisements in the Detroit papers to discuss the strike issues that are keeping 89,000 Chrysler workers idle.

In a seven column advertisement, Chrysler told Detroit, "Talk is cheap—but not at a cost of $1,188,773 a day to Chrysler employees."

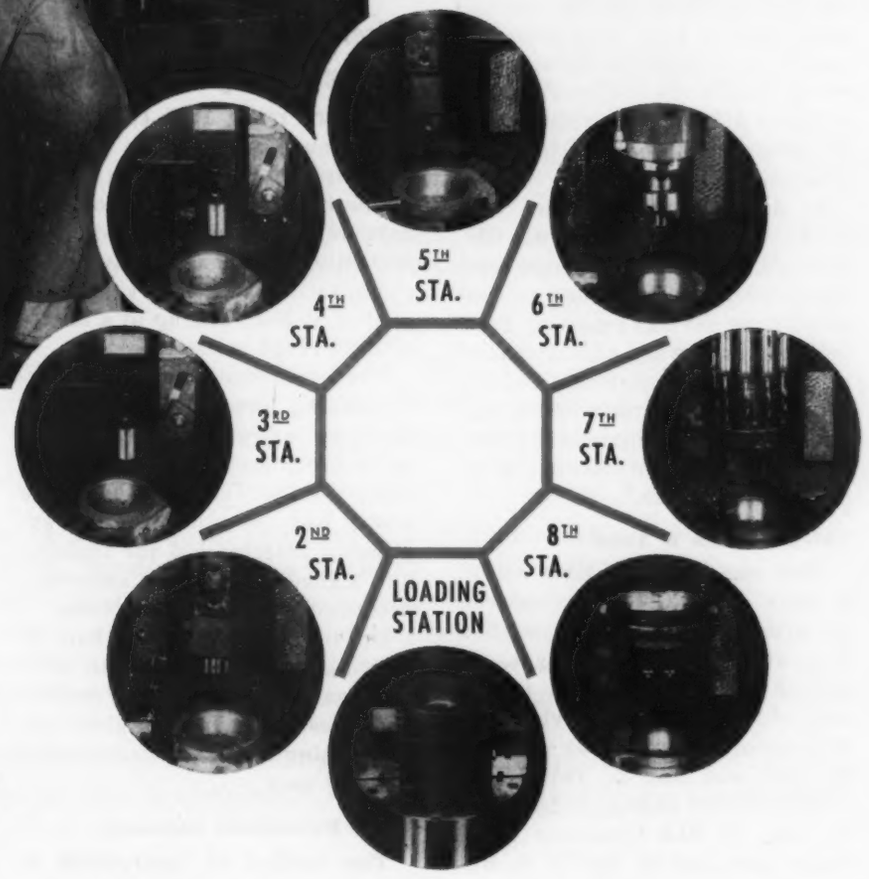
The ad then went on to say that Chrysler employees have lost more than a million dollars a day for four straight weeks. The company accused the union of stretching out negotiations by insisting on the discussion not only of pensions and insurance but also of the whole contract governing relations between employer and employee.

The union counter move was to call attention to the fact that Chrysler has flatly refused a request by Blue Cross for assurance that the company would make a deferred collection of insurance premiums after the strike is over. Because the company refused, the UAW stepped in to pay the workers' insurance premiums. According to union claims, the International Union will have to pay



A KEY UNIT TO LOWER COSTS

Whether Mult-Au-Matics are tooled for Versatility on a variety of the shorter run jobs or tooled for volume production, users have for many years proclaimed these machines, "Key units in lowering our manufacturing costs".



1st Station—:
Loading

2nd Station—:
Rough Bore—Three Diameters

3rd Station—:
Rough Face—Three Surfaces

4th Station—:
Finish Face—Three Surfaces

5th Station—:
Finish Bore—Three Diameters and Chamfer

6th Station—:
Precision Bore—Two Diameters

7th Station—:
Multiple Drill—Ten Holes

8th Station—:
Multiple Tap—Ten Holes

Many of today's economic problems are being solved through lower manufacturing costs. A Mult-Au-Matic installation may be the solution to some of YOUR PROBLEMS.

Let Bullard engineers study your manufacturing methods with a view towards reducing your manufacturing cost via the Mult-Au-Matic Method. Write for Mult-Au-Matic "Pictorial".

THE BULLARD COMPANY

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approximately $200,000 to Blue Cross to prevent employees' policies from lapsing. The union contends that in a strike situation most corporations have been willing to make the necessary arrangements to continue the hospital and surgical insurance coverage of their employees.

GM Price Cut in Line With Downward Living Costs Index

The price reduction of $10 to $40 on GM passenger cars and trucks is being interpreted here as an adjustment rather than as a price cut. It has been pointed out, for example, that the change would hardly have been made except for the wage cut of two cents per hr for 290,000 GM hourly workers and a $10 quarterly reduction in the allowance to be paid to 72,000 salaried employes.

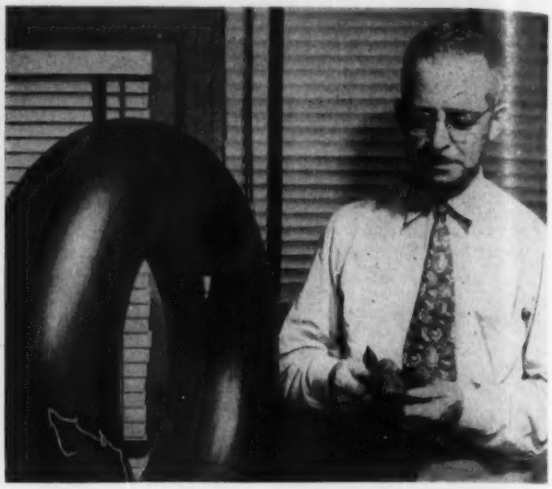
In announcing the price cut, C. E. Wilson, president of GM, said the latest adjustments were formulated to "pass along to consumers the savings resulting from both the downward adjustment of wage and salary payments and the lowered cost of certain items, notwithstanding the increased prices now being paid for steel and some other commodities."

Third Cut in a Year

This was the third time within a year that GM has reduced its prices simultaneously with a downward revision in wages, resulting from a reduction in the cost of living index. Previous announcements were made on Feb. 25, 1949, and May 23, 1949.

The current change is based on the Jan. 15 BLS Consumer Price Index compiled by the U. S. Bureau of Labor Statistics. The latest index is 166.9, compared with 168.5 for Oct. 15, 1949. Since Aug., 1949, GM has been adding .8 point to the index to compensate for an understatement in the rent component in the index.

Despite the downward wage adjustments, GM statisticians claim that hourly paid GM workers have had their purchasing power increased since the wage formula was adopted in May, 1948.



This new nylon lifetube built by the U. S. Rubber Co. is strong enough to support a car without any assistance from the casing. Reinforced with two plies of nylon cord, it is flexible and light in weight.

Kaiser-Frazer Briefs Sales Staff on Redesigned Product

Kaiser-Frazer 1951 cars which scored such a hit at the Chicago show are not going to lack selling support if Willow Run officials have anything to say about it. The recruiting of an aggressive sales organization is being vigorously pushed at K-F, aiming at a target of 8000 retail salesmen.

For some time now, K-F's merchandising department has had two-man instructional teams covering every section of the nation. Prior to the Chicago show, the teams had interviewed 1334 applicants, selected 555 for training and signed up 317 new salesmen, according to K-F Dealer News.

Up to Feb. 10, more than 40 meetings were held by 12 two-man teams. A total of 728 dealers and salesmen have been given up-to-the-minute sales instruction on the new cars.

Basic Procedure Stressed

The method of instruction is strictly informal. Basic procedure such as prospecting, appraisals, open and closing sales and product knowledge is stressed. The program is under the direct supervision of Edgar Kaiser and Walter de Martini.

Coordinated with the sales training program is an organized drive to build up quality and increase the quantity of K-F salesmen. Dealers are being carefully screened so that factory sales help will be concentrated on potentially valuable dealer franchises. K-F is also stressing to dealers the fact that the company now has a newly styled car in every price class.

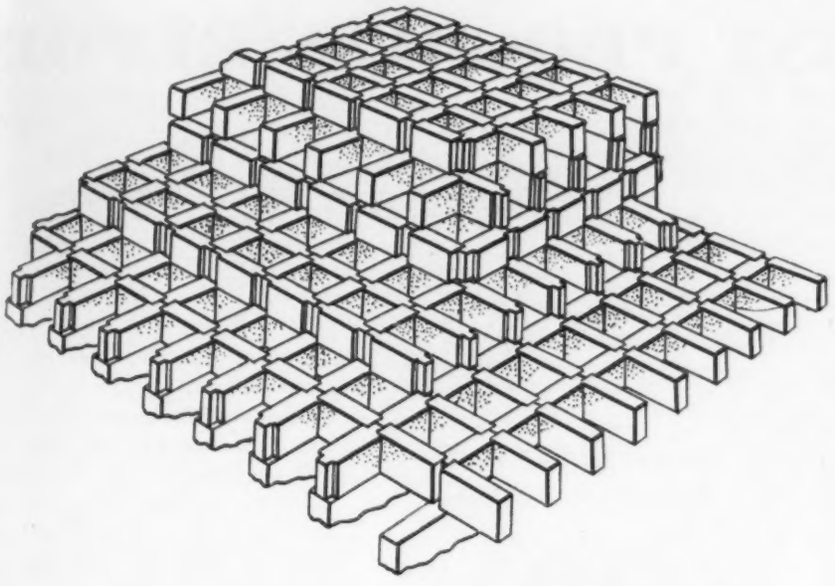
Last week K-F also announced it is going into production of its 1951 models on Mar. 1, two weeks ahead of the schedule previously announced. Workers are being called back and K-F expects to start up a second assembly line by the end of the month.

Ford Ups Buffalo Operations

In a recent speech before the Buffalo Chamber of Commerce, Henry Ford II, president of Ford Motor Co., gave a detailed description of Ford's plans for the new Buffalo pressed steel operation. In his talk, Mr. Ford disclosed that the company plans to take care of about 42 pct of its pressed steel requirements at Buffalo and the rest in Detroit. The Buaffo plant will employ about 3500 people when operations are at capacity. There will be about 3200 hourly workers. Counting the Ford assembly operations, the Ford Co. will employ about 5000 people in Buffalo.

Annual Ford payrolls in Buffalo are estimated at $13 million a year for the new plant. Ford statisticians estimate the company will spend about $28 million in a year in that area for supplies. The company's transportation bill in Buffalo alone will come to $11,800,000.

Let's Keep the Record Straight!



THIS IS OUR WALTERS SOLID FLUE CHECKER WORK

A refractories manufacturer has implied in their advertising to the steel industry that the checkerwork shown above is covered by an existing patent known as Hiller-Weber Patent No. 2,303,741.

It is not true that the Walters checkerwork infringes the Hiller-Weber patent, nor does the Hiller-Weber patent cover the checkerwork shown above, which is known as the Walters solid-flue checker. In order to refute this implication we wish to quote from an opinion* of our patent counsel:

> "The Walters checkerwork is not covered by and does not infringe the Hiller-Weber Patent No. 2,303,741. The single claim of that patent is expressly limited to three shapes of tile set in a particular manner and therefore does not cover and cannot be construed to cover a checkerwork in which only two shapes are used and one entirely omitted. The use of two shapes of tile instead of three is a departure from the claim of the Hiller-Weber patent and is not covered by that patent."

The Walters checker is priced at the present market price of brick, $86.00 per thousand, for both straight and special shapes (9 inch equivalent). The special shape is the same price as the straight.

The Walters checker gives the same size solid chimney flue as obtained with the 18 in. brick, laid basket weave, but eliminates the extra carried by the 18 in. brick.

*Copy of opinion will be furnished upon request.

UNION FIRE BRICK COMPANY

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WEST COAST PROGRESS REPORT

Pacific Northwest steel production drops . . . Imported steel comes into picture . . . Foundries continue in slump.

Digest of Far West Industrial Activity

by J. Reinhardt

Seattle — Northwest industries, digging out from the effects of a tough winter, are looking about much in the fashion of the groundhog in an effort to forecast the future industrial climate.

Even though there is abundant evidence both here and in Portland, Ore., of substantial amounts of heavy construction, steel producers, foundries and fabricators are generally in a definite slump. However, the top executives of these industries aren't too pessimistic about the immediate future and a few are optimistic enough to state that they believe they'll finish 1950 on a level only about 10 pct below 1949.

Producers are eying with some misgiving the dribbles of imported steel hitting the Northwest market. While considerable tonnages of bars, small shapes and nails have been moving into southern California, it is only recently that foreign steel has begun to appear locally since before the war. While no figures on total imports this year are available, a survey indicates that so far the tonnages have not been significant in spite of the considerably lower cost of the imported material.

Domestic Price May Drop

As an example, importers are offering to deliver 12-in. I-beams to Pacific Coast ports for $3.25 cwt, including extras and freight, whereas the same material if delivered in Seattle from Geneva Steel Co. in Utah would cost $4.40 cwt. This saving of $23 per ton looks tempting to more than one jobber and builder. According to those who have seen samples and analysis reports there is no basis for criticism of the steel quality which is produced in Belgium. Freight from Antwerp was reported at 57 cents cwt as compared to the 70¢ cwt rate from Geneva, Utah.

A small tonnage of bars and small shapes is now enroute to Seattle, as is a few hundred tons of European pig. This iron is being sold to a few foundries at approximately $6 below the delivered cost of domestic iron. Importers aren't too eager to bring in more pig without firm orders since there is a feeling that a drop in the domestic price may occur.

Nails Plentiful Again

Nails which were on the gray market not too many months ago are plentiful again and those produced abroad aren't getting an enthusiastic welcome locally. While imported 10d's were offered here last May at $8.57, more recent quotations were closer to $6 per keg in minimum lots of 500 kegs. Some barbed wire is moving into the northwest from abroad.

Canadian coal was expected to move into Washington this week if the coal strike continues. As elsewhere, Washington state's 1500 coal miners hadn't returned to work late last week and industrial and domestic bins were low.

Since establishment of a foreign trade zone here last September, there has been increased interest by importers in the possibilities of utilizing this facility for foreign steel. Any material delivered and retained in the Zone remains duty free until sold and taken out of the Zone for delivery. Among the advantages are that no outlay for duty is made until time of delivery and the steel may be "manipulated" during this storage in the Zone. One importer is con-

SOFT GRAY CAST IRON
Tensile 30,000 psi

"GM" MEEHANITE Metal
Tensile 60,000 psi

STEEL CASTING—0.38%C
Tensile 73,500 psi

Combines the best properties of both cast iron and steel!

The description of Meehanite metal as "Bridging the Gap" between cast iron and steel was first written just 11 years ago. Since that time Meehanite castings have been providing designers, engineers, casting users, with a superior quality material. By offering unique combinations of the better properties of both iron and steel they have met many unusual demands and specifications.

The basic facts are revealed by the microstructures of the three materials. The ability to control both the quantity, size and form of the graphite as well as the nature of the pearlitic matrix of Meehanite metal, provides the means of predetermining engineering properties so as to meet exacting specifications.

Whether you need a soft, average-property iron (30,000 psi) or a tough, high-strength material providing uniform solidity, quality and dependability, specify Meehanite metal and consult any of the foundries listed below.

Ask for the Handbook of Meehanite Metals, a 67-page engineering manual which will prove of real value to any casting user.

Take Your Casting Problems To A MEEHANITE Foundry!

American Brake Shoe Co. — Mahwah, New Jersey
The American Laundry Machinery Co. — Rochester, New York
Atlas Foundry Co. — Detroit, Michigan
Banner Iron Works — St. Louis, Missouri
Bassett Foundry & Machine Co. — Irvington, New Jersey
E. W. Bliss Co. — Hastings, Mich. and Toledo, O.
Builders Iron Foundry Inc. — Providence, Rhode Island
H. W. Butterworth & Sons Co. — Bethayres, Pennsylvania
Continental Gin Co. — Birmingham, Alabama
The Cooper-Bessemer Corp. — Mt. Vernon, Ohio and Grove City, Pa.
Crawford & Doherty Foundry Co. — Portland, Oregon
Farrel-Birmingham Co., Inc. — Ansonia, Connecticut
Florence Pipe Foundry & Machine Co. — Florence, New Jersey
Fulton Foundry & Machine Co., Inc. — Cleveland, Ohio
General Foundry & Manufacturing Co. — Flint, Michigan
Greenlee Foundry Co. — Chicago, Illinois
The Hamilton Foundry & Machine Co. — Hamilton, Ohio
Johnstone Foundries, Inc. — Grove City, Pennsylvania
Kanawha Manufacturing Co. — Charleston, West Virginia
Koehring Co. — Milwaukee, Wisconsin
Lincoln Foundry Corp. — Los Angeles, California
E. Long Ltd. — Orillia, Ontario
Otis Elevator Co., Ltd. — Hamilton, Ontario
The Henry Perkins Co. — Bridgewater, Massachusetts
Pohlman Foundry Co., Inc. — Buffalo, New York
The Prescott Co. — Menominee, Michigan
Rosedale Foundry & Machine Co. — Pittsburgh, Pennsylvania
Ross-Meehan Foundries — Chattanooga, Tennessee
Shenango-Penn Mold Co. — Dover, Ohio
Smith Industries, Inc. — Indianapolis, Ind.
Standard Foundry Co. — Worcester, Massachusetts
The Stearns-Roger Manufacturing Co. — Denver, Colorado
Traylor Engineering & Mfg. Co. — Allentown, Pennsylvania
Valley Iron Works, Inc. — St. Paul, Minnesota
Vulcan Foundry Co. — Oakland, California
Warren Foundry & Pipe Corporation — Phillipsburg, New Jersey

"This advertisement sponsored by foundries listed above."

MEEHANITE®

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sidering bringing in some steel bars which he will shear while in the Zone.

Import Duty Unimportant Factor

Import duty on steel is so low that it is a relatively unimportant factor in its delivered cost. Local port authorities report duty on structural beams as 0.125¢ per lb and on plates 10 pct ad valorem, but not less than 0.175¢ per lb.

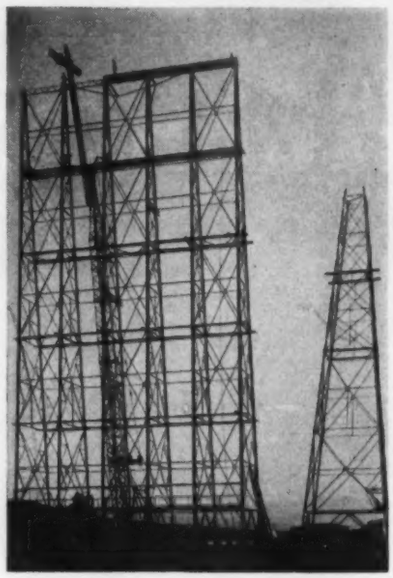
As yet Northwestern steel producers haven't placed the responsibility for their production slump on imported steel but rather on the winter doldrums which has hindered if not stopped some important projects. Warehouses appear to be enjoying a relatively higher volume of business than the prime producers, but even in this field there has been a definite falling off in volume during the past several months. Prices remain stable and there are definite indications of improvement in the near future. The only items which maintain a volume in the allocation class are sheets of all grades, with bars and small shapes going begging.

A note of optimism in the steel fabrication picture is the construction of Bethlehem Pacific Coast Steel Co.'s new facilities for its fabricated steel construction division here. When completed there will be approximately 200,000 sq ft under roof on the 8-acre site and will include a tower department and 35-ft galvanizing tank.

Pacific Car and Foundry Co. expects to get its new fabricating division in operation by April with all facilities in production soon thereafter.

Boeing Has Ace in the Hole

Despite rumors to the contrary, Seattle's largest employer, Boeing Airplane Co., expects no further major reductions in payroll at least until well toward the year's end. From a peacetime high of 25,000 employees, the payroll dropped to approximately 18,000 and is expected to remain fairly constant for the next three or four months and to wind up the year at about 15,000.



STEEL FRAMES: Erection of Bethlehem Pacific Coast Steel Corp.'s new 160 ft. high steel frames for testing transmission towers at its South San Francisco Plant. They represent the only steel testing frames for transmission towers west of the Mississippi.

Boeing has a potential ace in the hole in studies now being made in the industrial field other than aircraft although nothing is being said publicly about which direction these investigations are being made.

Seattle has a great deal to be cheerful about: last week unemployment in the State dropped at least 6,500, as that many ceased drawing unemployment insurance; one large department store gets under way with a 5-story enlargement; another undertakes a $15 million, 16 square block development; at long last work begins on a superhighway; several large apartment houses near completion; and the University of Washington launches a building program to add about 50 pct capacity to its stadium. True, these are but straws in the wind, but they're big enough straws to at least indicate its direction and force.

Future Air Weapons Developed

Los Angeles — Although they have been working quietly, sometimes using new metal alloys secretly, the backbone of the aviation industry in this area, especially in engineering, has recently been the development of weapons for the future.

New contracts have been announced for jet planes and similar fighting craft, but considerable work is being concentrated on electronically guided planes and guided missiles.

An insight into the importance of this work is given by J. H. "Dutch" Kindelberger, head of North American Aviation, who commented:

Modern Airplanes Too Complex

"The airplane is on the way out, not tomorrow or 10 yrs from now, but it is definitely on the way out as a final military weapon . . . North American is working on new forward steps in this fighting business . . .

"The complexity of modern airplanes and the problems of air warfare are getting beyond the limits of the human pilot . . . The next step is to give the pilot electronic aids and the following step is to leave the pilot on the ground."

Mr. Kindelberger visualized one of the next major improvements as being a plane which can have instruments fly it to the target after being piloted in the right direction.

"The plane will stay with the bomber, calculating its speed and course and probable future speed and course. The instruments will fly the plane in such a manner that it will throw at the bomber a killing load and still avoid being shot down by anything that we can presently conceive in the way of a bomber," he added.

Douglas Receives Navy Order

On the more immediate side, Douglas has received a Navy order for 70 all-weather twin-jet fighters and 53 propeller attack bombers. Lockheed is to build 45 patrol bombers and 10 jet training planes.

Mr. Kindelberger's company has been given a Navy order for 15 additional attack bombers capable of carrying an atomic bomb.

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SEYMOUR NICKEL SILVER skillfully used in the form of stampings, spun parts, milled and screw machine products, adds measurably to the quality of superb instruments like this. If quality is the keynote of your product, in your own interest, consider the use of

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THE FEDERAL VIEW

THIS WEEK IN WASHINGTON

SEC attempts to extend its regulations and filing requirements . . . Military shipments to North Atlantic Pact countries begin . . . Patman attacks opponents.

by Eugene J. Hardy

Washington — Recent hearings on a bill (S.2408) to extend the powers of the Securities and Exchange Commission brings to mind the old story about the camel getting his head in the tent. This measure, introduced by Senator Frear, D., Del., would extend the many requirements of the SEC law to firms having $3 million in assets or at least 300 stockholders, even though the securities of such firms are not dealt in on the national securities exchanges.

Bill Harms Small Business

SEC says that the extension of its regulations and filing requirements to such firms is logical and that it must be done to protect investors. It is claimed that there is considerable fraud which they cannot now reach, due to the fact that thousands of firms are beyond the powers of the agency. Congressional sources point out that SEC has a difficult time fulfilling its existing responsibilities and is often many months behind on its present work. Cited as a case in point where the SEC had jurisdiction, but did not adequately protect the public interest is the history of the ill-fated Tucker Corp.

Sen. Frear also claims that his interest is to protect the investor and states that letting these small firms stay outside SEC requirements "seems an accident rather than a deliberate omission" from the original law. In addition to SEC support, the bill is backed by the national securities exchanges and the National Association of Securities Dealers. However, small associations of securities dealers and businessmen who have appeared before the Committee, such as the Ray-O-Vac Co., have opposed the bill on the grounds that it would be detrimental to small business by inhibiting an important source of new capital. Opposition has also been expressed on the grounds that the bill would force small firms to make public information that might be used by their larger competitors. Another opposition argument is that state laws protect investors insofar as getting information about companies is concerned.

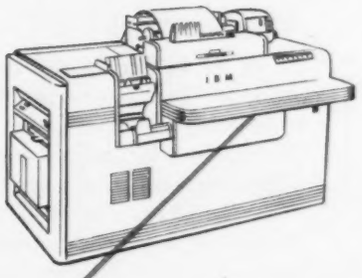
Sen. Frear hopes to obtain a favorable report on the bill from the Senate Banking Committee and get it to the floor sometime this month. Chances for passage at this session, however, are exceedingly slim. The House has before it similar legislation (H.R. 7005), but the House Interstate and Foreign Commerce Committee has not scheduled hearings on the bill. Then too, with the White House trying to curry favor with business, particularly small business, in this election year, there is not likely to be strong pressure for a measure which would place an additional burden of paper work on small business.

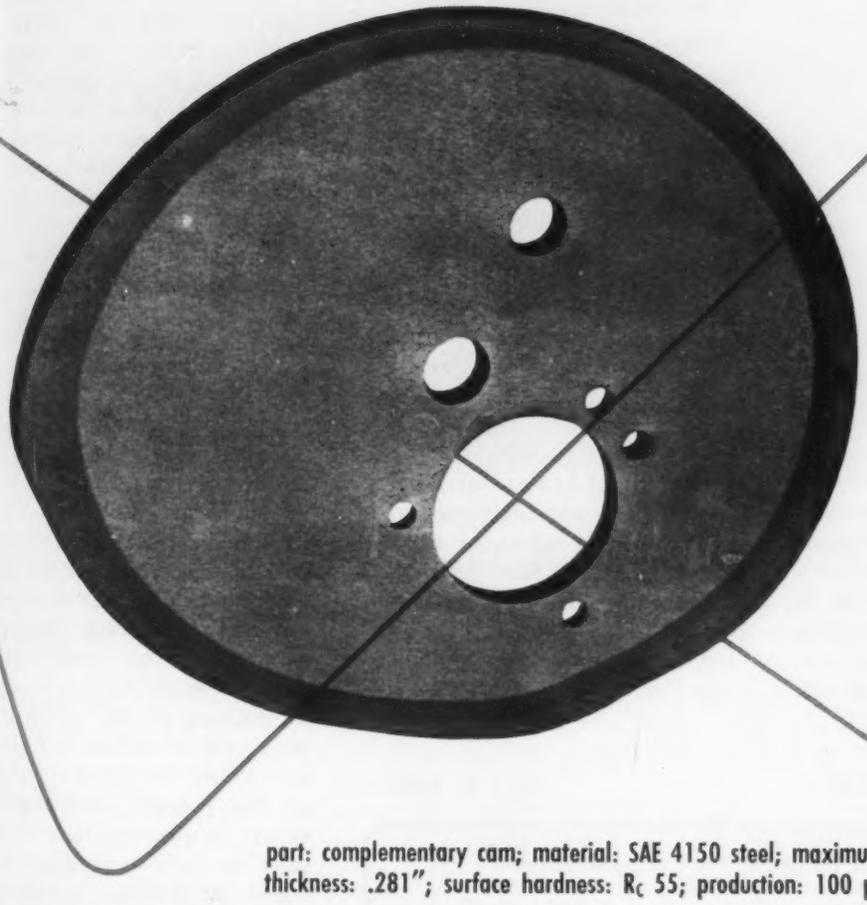
Start Military Shipments To North Atlantic Pact Countries

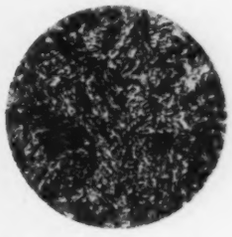
Shipments of military equipment to North Atlantic Pact countries under the Mutual Defense Assistance Program should begin in a matter of days. Material from U. S. Army excess stocks has been accumulating at East Coast ports for many weeks.

Of the total $1.3 billion pro-

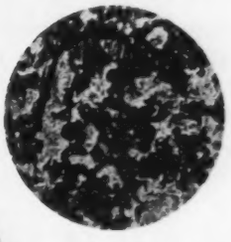
amatic hardening helps this M accounting machine to "think"







Above: structure at surface
Below: structure at transition zone.



part: complementary cam; material: SAE 4150 steel; maximum radius: 4" thickness: .281"; surface hardness: R_C 55; production: 100 pieces/hour.

fH

flamatic hardening machine processing cams at International Business Machines Corp.

Look at the uniform depth of hardness on this cam – surface hardened on the Cincinnati Flamatic—and held flat within .001." Cams like this drive type bars which flash the answers to punch card problems on the IBM Model 403 accounting machine. These parts are flamatic hardened at the rate of 100/hour and used in the fully hardened condition tempered at 425°F. No subsequent corrective operations!

Operator simply loads part on spindle, pushes button, and Flamatic does the rest, heats part with high temperature flames so rapidly that heat is confined **to specified areas,** electronically controls surface temperature within plus or minus 5°F., deposits part in oil quench and conveys parts out of tank automatically . . . Gears, cams, etc., up to 18" OD or spindles up to 24" long are readily handled on standard Flamatic. Booklet of case histories entitled **"fH" may point the way** to making your product serve better or cost less. Write for it, or send a part print for recommendations.

flamatic

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gram, $1 billion is for the North Atlantic Pact countries, and the remainder is for Greece, Turkey, China, the Philippines and Korea. Other nations may buy from the Defense Dept. for cash. Of the $1 billion total, $500 million is in cash and $500 million is in contract authority. One of the problems is getting all the funds obligated before the congressional authority expires on June 30. However, there can be later shipments under the contract authority provisions of the law. MDAP officials told THE IRON AGE that the programs have been pretty well set up, and that completion of the first year program by June 30 will depend largely on how fast the paper work can be handled.

Congress Authorized Shipments

The first shipments will be composed entirely of excess military equipment. Congress authorized shipments from this source up to $450 million. However, the entire value of excess equipment will not be charged against the program. Only the amount required to put this material into usable condition will be so charged.

Patman Attacks Opponents Of His Small Business Ideas

Congressional solicitude for small business is as constant as the flow of water over Niagara Falls. Some of it is sincere as clearly evidenced by the work of the Senate Small Business Comm., which has recently been re-constituted after being allowed to expire at the close of the Republican-controlled 80th Congress. This committee's work on steel during the period of the acute shortage in 1948 has generally been regarded as having been fair, impartial and helpful. Then too, as pointed out by Senator Wherry, R., Neb., who was instrumental in getting Senate approval for the new committee, this group will not only do something about "big business" and "big finance," but "big labor" and "big government."

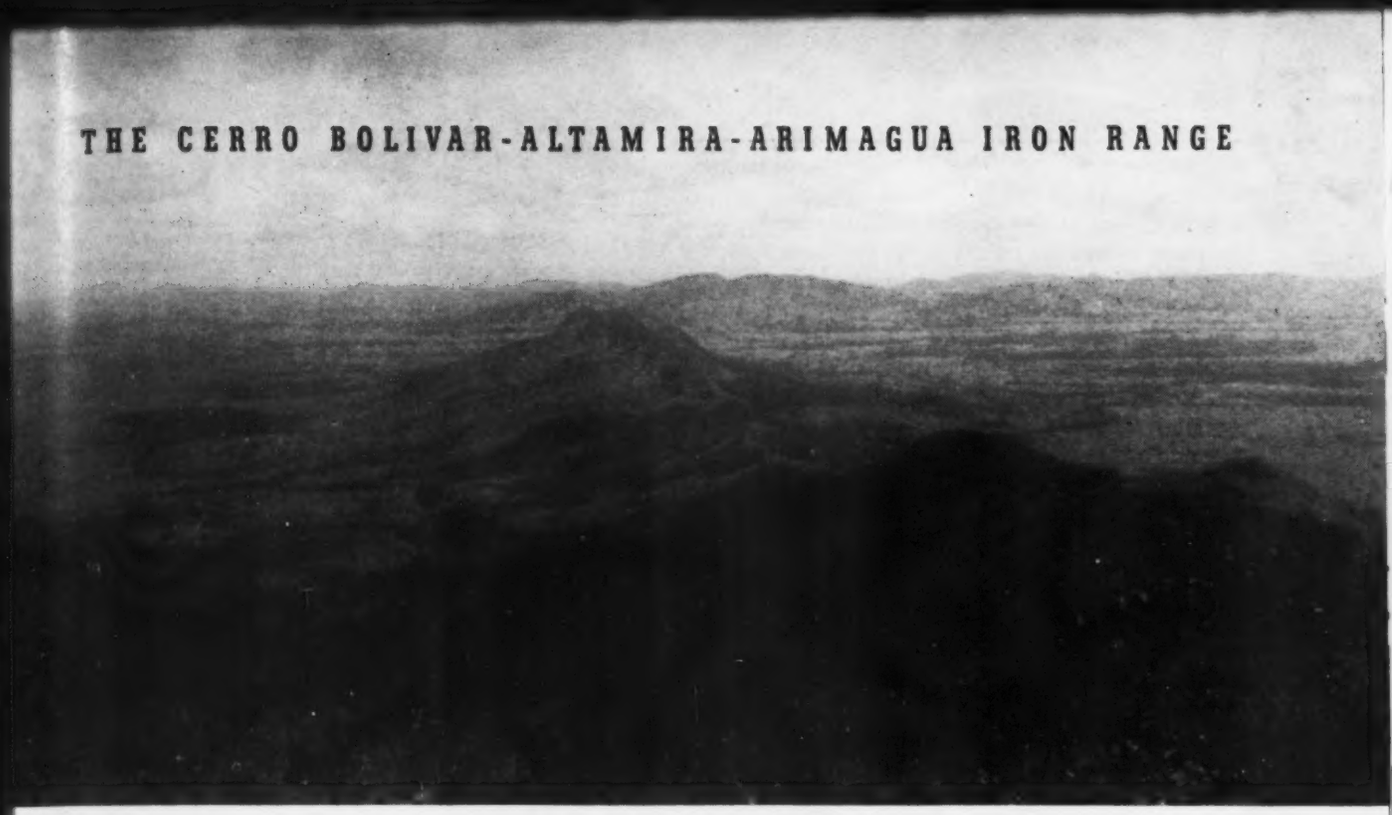
On the other side of the fence however, is the House Small Business Comm., headed by Rep. Patman, D., Tex., who is currently running this group as his own personal province. During the current session of Congress, Mr. Patman's idea of helping small business has been to use the committee to: 1—expound his personal viewpoint on economic problems; 2—assure the continued operation of a steel mill in the First Texas Congressional District; and 3—attack anyone who disagrees with his ideas on small business.

Doesn't Inform Members

Mr. Patman does not even bother to tell the other members of the committee what the staff is doing. This is clearly indicated by the minority views to a recent committee report. These views, signed by Rep. Halleck, R., Ind., pointed out that the committee as such "has never considered or weighed any of the evidence purporting to support the statements and charges made in the report, and no meeting of the committee was ever held at which any such evidence was discussed or the terms of the report considered." The report in question is a vicious attach on four organizations with which Mr. Patman has been feuding for a number of years. The whole thing started out as an investigation of who backs the various small business organizations. The committee began with 45 such organizations but wound up investigating only four. Significantly, all four are organizations which violently disagree with Mr. Patman's ideas. Two of them do not even call themselves small business organizations, but apparently the fact that Mr. Patman does not like them is sufficient reason for him to investigate.

While Mr. Patman apparently sets himself up as the final arbiter as to who will speak for small business, he has selected an interesting group of organizations with which he meets before deciding what work the committee shall undertake.

THE BULL OF THE WOODS — By J. R. Williams



U. S. Steel's Answer to the Iron Ore Shortage

This is a story of cooperation and confidence among men. These two traits have made possible a backlog of more than 1½ billion tons of high grade ore in Venezuela. Tom C. Campbell, Iron Age Editor, writes an on the spot human interest story of this fabulous discovery.

By TOM C. CAMPBELL
Editor, The Iron Age

This is the first eyewitness story by an American reporter on U. S. Steel's strategic iron ore find in Venezuela. Tom Campbell flew 5500 miles, rode 200 miles in jeeps and cruised up and down the Orinoco to get material. The first article ever to be published on Cerro Bolivar was in THE IRON AGE, Dec. 30, 1948, a year before recent publicity.

Ciudad Bolivar, Venezuela—Mack C. Lake, the perennial and respected explorer around the globe, is only partly satisfied today. He is entering one of the most important phases of his career—after closing one of the most exciting and brilliant ones.

U. S. Steel has found the iron ore it so badly needed. Mack, now president of the newly formed Orinoco Mining Co., has the job of supervising building of a railroad, docks, terminals and getting the ore coming into the Eastern coast within 5 years. From what has been done in the past 5 years there are no worries over this latest assignment.

But first let us point out that the search for ore in Venezuela by the U. S. Steel Corp. was not a hit and miss thing. Not a lucky break. Not

Continued

something out of the crystal ball. It was one of the most thorough, painstaking and comprehensive explorations in the history of iron ore searches.

When Mack Lake saw Ben Fairless, U. S. Steel president, a year after the search in Venezuela had begun, he said: "We want to make such a thorough search for iron ore in Venezuela that if we do not find it no one else will."

Ben being what he is answered, "That's the only way to do it. I am behind you 100 pct." Then the search began in earnest with the keen excitement and support of John G. Munson, the man who took the assignment from Mr. Fairless to find enough ore to last the corporation for the next 100 years at least.

Mack Lake had a great team to start off with in Venezuela. He had Cay Burrell, brilliant geologist, and now assistant to Mr. Munson at Pittsburgh. He had Folke H. Kihlstedt, an experienced engineer, and Bill Boeckmann, a man who can take any jungle in his stride and come out smiling. He also had Fred Wright, a hard working geologist on his way up.

There were other men in the beginning who were not in on the end of the race. They included Paulik and Earl Nixon. Their names are still mentioned with respect in camp today.

The initial search for ore in Venezuela took place along the Orinoco. Parties were sent south from the river in hopes that bodies of ore would be found. There had been evidence of ore south of the Orinoco and east of the Caroni River. Much of this search meant that one man with a few local guides and helpers treked into jungle territory visited only by a few natives.

It was a tedious job which started in September 1945. It was a tough job. Plans were changed as new information was gained. Thinking had to be straight to screen out the nonessentials and keep the venture on an even keel towards its goal.

One of the first strikes was the Piacoa deposit near the Orinoco River. This was acquired and is a low grade concentrating ore running about 45 pct iron. Late in 1946 a concession there was granted for 40 years, the land being in Federal Reserves. By the end of 1947 more than 125 million tons had been proven.

PIONEERS: Left to right: Folke Kihlstedt, manager of development; F. B. Cronk, Oliver Mining Co.; and Mack C. Lake, Big Chief.

But this was not considered to be the solution to the ore problem. While work at Piacoa was going on other parties were looking. About this time some deposits were found deep in the jungles south of the Orinoco not far from El Pao. This later became known as La Grulla, with five concessions of about 100 square miles. The property is on Federal Reserves and concessions are limited to 40 years.

It was after a change in plans of search by the use of aerial photography supplemented with ground work that La Grulla showed its worth. It can't hold a candle to what was to come later but you can't tell that to Russ Bryan, the still young engineer who is in charge of La Grulla and spent periods and experiences there that would rival any yarn in the adventure books. (Russ earlier had charge of a much greater find—Altamira.) The ore found at La Grulla is good openhearth lump ore and will play its part in the overall picture. Drilling was completed in October 1949. But while La Grulla is nothing to sneeze about there was bigger game in the making while searching went on there.

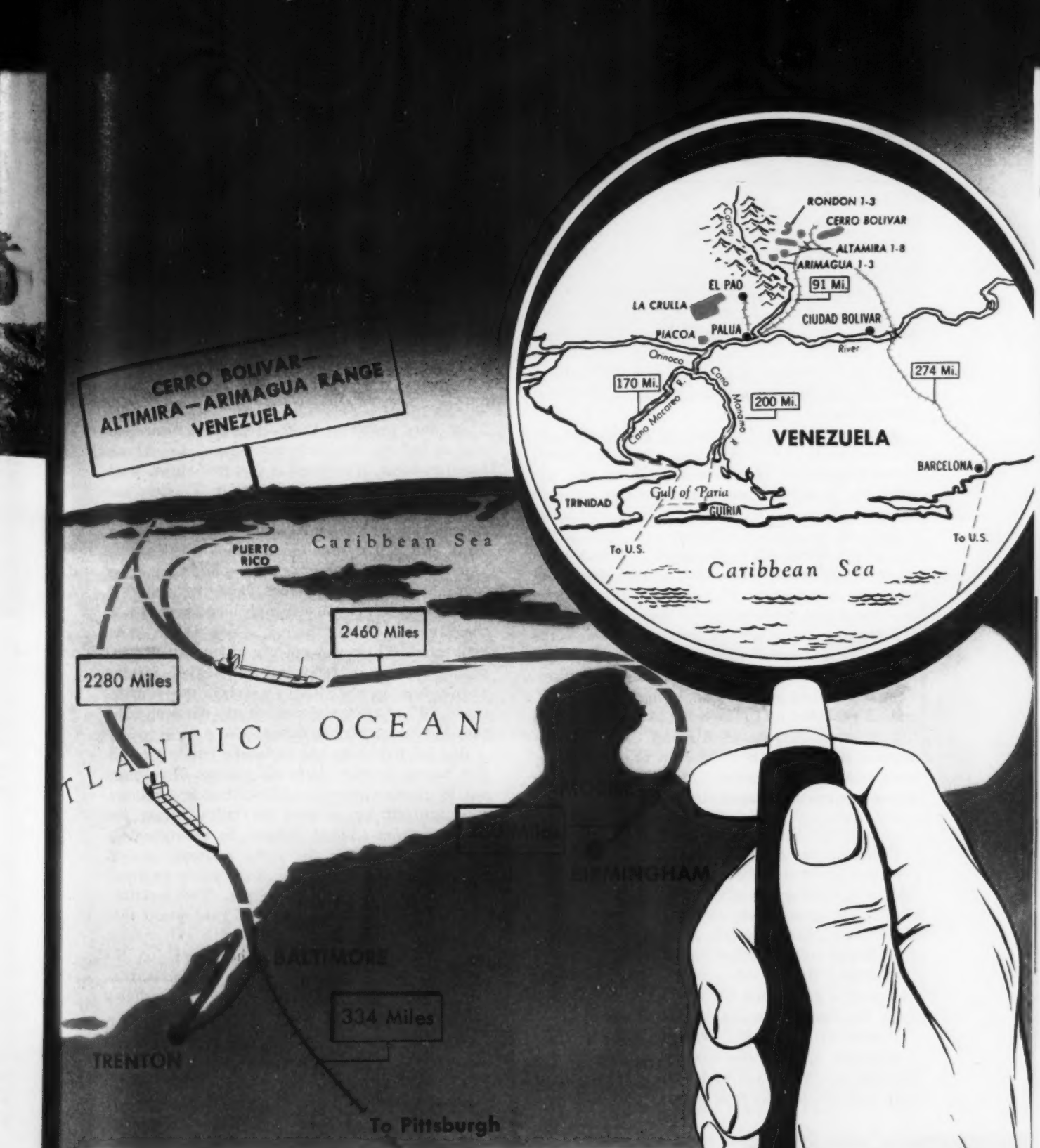
It had always been supposed by mining men, the government and geologists, that there was no ore of any scale west of the Caroni River. Most everyone felt the same. How little they knew! It is a tribute to Mack Lake, Folke Kihlstedt, Cay

VENEZUELA'S PART

From the beginning the governments of Venezuela have bent over backwards in cooperation. There was no suspicion. Only help and encouragement.

The government, knowing that its economy had been based on oil alone, is striving for more industries. The support in high government circles, in the press and among business men, has helped Mack C. Lake.

By its concessions the government has proved that it wants American enterprise in Venezuela. Efforts are under way to expedite all the necessary legal matters essential for the U. S. Steel transportation details.



Southern Ore Outlook:

A superhuman eye with abnormal perspective looks south and east from U. S. Steel's Pittsburgh headquarters. It sees Venezuelan iron ore on the horizon and its paths to U. S. furnaces. The magnifying glass picks up Venezuela and its ore deposits.

Except for the Bethlehem Steel Co. railroad from its mine at El Pao to Palua on the Orinoco, the railroads are tentative. U. S. Steel's ore may either move out by rail to Barcelona or by rail and river to a transfer station on the Gulf of Paria.

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Burrell, Bill Boeckmann and Fred Wright—they did not know anything about negative thinking.

In January 1947 Mack Lake reorganized his setup making Cay Burrell, chief geologist and Folke Kihlstedt, resident engineer. A little before this time it had been decided to rely heavily on aerial photography. A large part of the State of Bolivar was photographed by Fairchild Aerial Survey Co.

A tribute to the discovery of the bigger ore bodies goes to the U. S. Army which had taken aerial pictures of Venezuela in 1945 for the government. Strips had been taken shooting straight down and then away on either side so that large areas could be studied. These prints were in the files of the Venezuela Government. If there is no other single proof of friendship and cooperation from the government of Venezuela it would be the offering of these prints to Mack Lake's men.

Following the study of these prints and the ground by geological survey and exploration the whole picture of search was dovetailed together. Then everything was located on maps. All information gathered up to the early part of 1947 plus the recommendations of Kil and Cay were assembled by Mack Lake to present to the management of U. S. Steel in the United States. This is where cooperation played its part again.

Confidence Pays Off

Ben Fairless, John Munson, Enders M. Voorhees and the board of directors had so much confidence in their exploration party that they gave a complete green light to go ahead with what Mack and his team wanted. It was good that they did. It was good that the Venezuela Government felt as they did. It was good also that foresight was used to get a good law firm in Caracas which knew the Venezuelan laws and officials.

It was to Dr. J. M. Travieso-Paul, brilliant Venezuelan lawyer who has the demeanor of a supreme court justice and is humanitarian as well, that Mack Lake took many of his problems.

IRON ORE STAKES

Claims	*Time Staked*
Carla 1-5, Cerro Bolivar	April 1947
Arimagua 1-3	June 1947
Rondon	July 1947
Frontera, east end of Cerro Bolivar	Acquired from local claim holders, April 1948
Altamira 2-6-7-8	Acquired from local claim holders, April 1948

They were problems that often could mean success or failure. Intricate procedures. Local laws. Local customs. How to do it fast and right. Mack has been lavish in his praise of Dr. Travieso and his staff. The filing of claims and arrangements for concessions are not easy matters in Venezuela. That's where Dr. Travieso came in—and good.

After much mapping, exploring and aerial photography some strips were developed early in March 1947 which caused high blood pressure in the camp at Ciudad Bolivar. Yet it had to be kept mum. There were plenty of intelligent local people who were following the Oliver Mining people like hawks. They watched every move made. They followed searching parties. And they listened with big ears.

Big Kil Kihlstedt had to be the quietest of all. But he can do that. It is his nature. He slipped out by jeep on Apr. 3, 1947 with a few helpers. By nightfall he covered 60 miles across the savanna from Ciudad Bolivar to the mountain which showed up in the aerial pictures taken a few weeks before. On Apr. 5 the party returned and took steps to make claims. The territory then was not Federal Reserves. This meant that the regular staking of claims with explanation was all that was needed. The claims on the mountain were made in the name of Carla, that lovable wife and helper of Kihlstedt who shares the enthusiasm of the find with her husband.

Other people from Ciudad Bolivar went into action and also got claims which were later acquired by Oliver Mining. This meant that U. S. Steel was to have one of the biggest ore finds the

MOUNTAIN CAMP: Here is the camp one-third the way up Cerro Bolivar. It is now historic. Those lumps are 63 pct or more iron.

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world has ever known (see accompanying table). it, and the vast Quebec-Labrador strike will keep the United States in high grade ore for hundreds of years to come.

The claims which Orinoco Mining Co. (new firm to handle Venezuelan ore) now has in the Cerro Bolivar area are for 50 years with the right to extend another 50 years. The attitude of the governments—nation, state and town—is one of helpfulness from the highest to the lowest. In all his dealings with the government Mack Lake has made available to the Ministers in charge of mines and interior everything that his men have found, what it meant and what they intended to do. There was nothing kept back.

Each time that there were things to be done, maps to be made or plans to go, Mack Lake, through Dr. Travieso-Paul's organization, fully informed the government. Only a few weeks ago the press of Caracas was told just what U. S. Steel intended to do. And to show what the people of Ciudad Bolivar think of Mack and his wife Louise, let's see what happened a few weeks ago.

Mack had come to Ciudad Bolivar for a routine check. In the morning he planned a party for officials, business men, and camp people for that evening. He was overwhelmed when 200 attended, including the Governor of the State of Bolivar, the army commandant, leading business men and newspaper publishers. The report in the local paper next day would make any public relations man in the United States slap-happy when he read of the praise of Mack Lake, his wife, his men and the U. S. Steel Corp. But that was only the result of the type of action, thinking and relationship that came the hard way for the past 5 years down here.

Hard Work Begins

After the big find the hard work began. Drilling began on Cerro Bolivar in October 1947. Exploration work was essentially completed in June 1949 after 90 holes were drilled and 3 tunnels had been completed in this hematite-limonite ore body. But these figures on drillings, tunnels and ore are only part of what went into that work.

Drills had to be brought in. Jeeps shipped in. Dodge power wagons used; caterpillar tractors shipped to the spot and the back-breaking job of building roads started. The camp was set about one third the way up Cerro Bolivar. At first tents and thatched waterproof rooms were used. Roads had to be cleared on the way to Cerro Bolivar from Ciudad Bolivar—more than 60 miles away.

The road to the top, Morgan Leonard, camp boss, can tell you, was rough and tough. It is a winding road to the top of Cerro Bolivar carved out of the side of the mountain. But it was done. And now the camp at Cerro Bolivar is well organized with a staff house, houses for the resident chiefs, and the old trouper, Bill Boeckmann, who itches to get his labor gang started after the railroad decision is made.

But here is the place to give the women a pat on the back. Many of the geologists, engineers and office people would not have been able to keep up their morale to half the pitch had it not been for the wives coming along and putting up with anything and everything in the early stages. I met and came to know Kil's Carla; Russ Bryan's Lilli; Morgan Leonard's Maizie; Tom Oftelie's Helen and Walt MacMurtrie's Eva. They and those who went before have played their part well in a life that has not been a bed of roses. And Louise Lake has done more to keep Mack flying at full mast than can be told here.

All that can be done now has been done until U. S. Steel decides whether they will build a railroad of about 90 miles to the Orinoco and barge the ore about 75 miles down the Orinoco out the Macareo River into the Gulf of Paria—another 100 miles—and then to Mobile and Baltimore and

NOT A STREAM: This is a river which in rainy season will swirl over the bridge and anything on it during flash cloudbursts.

HOW MUCH ORE?

The main part of the iron range—Cerro Bolivar—has been tested and drilled. Iron ore reserves there alone stand at about 500 million tons. This ore is high grade and analyzes:

	Pct
Iron	63.30
Phos	0.106
SiO_2	2.32
Mn	0.11
Al_2O_3	1.94
Ignition loss	5.21
Natural iron	57.00
Natural moisture	8 to 10

But there are other parts of the range—Altamira, Rondon, Arimagua — which are estimated to be as rich in quantity and quality. It is more than probable that the range will eventually yield more than 1½ billion tons of high grade ore.

The mountains in the range are not solid iron ore. The ore bodies are known as lenses—or crusts, or frostings in everyday language. The high grade ore is at the top of the mountains in the form of a bowl or deep saucer.

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Trenton on ocean ore carriers. Or to build a 274-mile line crossing the Orinoco with a bridge and continuing up to tidewater near Puerto La Cruz.

The Gahagan Overseas Construction Co. has made a survey on the costs and feasibility of dredging the Orinoco initially to a depth of 26 ft and eventually to 34 ft. Late in 1949 orders were given to make an aerial survey and furnish maps of the Orinoco-Macareo River route if that way of shipment should win out. These maps will be most complete and will be delivered in the next few months.

In midsummer of 1948 S. G. Groves & Sons Co. were employed to survey and investigate on rail transportation of iron ore from the Cerro Bolivar deposit. They had two projects to study: The transportation to tidewater on the North Coast of Venezuela with a loading terminal near Puerto La Cruz; or the transportation of ore from Cerro Bolivar to a terminal and loading dock at the confluence of the Orinoco and Caroni Rivers.

The longer railroad will require a bridge of considerable engineering skill to take care of the river rise (65 ft) in the rainy season. American Bridge Co. engineers have made a survey to locate the bridge a few miles above Ciudad Bolivar across the Orinoco and have developed preliminary design costs.

When the railroad choice is made—and that will be soon—there remains the building of the roads, the town and bringing in the technicians to establish methods of conveying the ore down from the mountain. The town site and the railhead at the base of the mountain will be on the high side of the savanna and on the opposite side from where the camp is now.

Aside from the details on the setup and the ore which are shown in the accompanying tables and pictures the ore find is chock-full of interesting sidelights on people. Mack Lake will spend hours telling you that he has had nothing but the best of cooperation from his people.

He tells about Union Supply Co. people who realized the job they had in getting the right food down to Venezuela. The main thing down there is fresh water and good food. Without those two things life is not so rosy. At first the work was so difficult that after 6 months men had to be sent back to the States for a month. Not to have done this would have meant a loss of manpower and a lower morale. As things got better, as roads were built and water piped to the cabins at camp and as more and more food came in working conditions improved. Now the men sign for a 2-year contract and go back to the States for a spell. But they come back again.

BUSINESS OPPORTUNITIES

U. S. Steel hopes to have the most modern conveying systems possible in bringing ore down from the top of the mountains. This means belts, motors and the latest in material handling.

It is even planned to generate power by the gravity flow of the ore down the mountain side.

The requirements for the railroad will be tremendous. Cars, diesels, repair shops, oil and parts will be needed.

The town site means building a complete town with all the most modern houses, electrical plant and sanitary conditions.

Loading docks will be a big feature no matter which railroad will be built. The impetus to home industry—oil—in Venezuela will be tremendous. But American companies will supply the conveyers, railroad cars, jeeps, motor trucks, pipe, tractors and a hundred and one other things.

WHEN?

U. S. Steel expects to have ore coming from Venezuela within the next 5 years. Eventually about 10 million tons a year will be moving to the United States, some to Mobile; and some to Baltimore or Trenton for the new Eastern steel plant.

The Oliver Mining Co., first with Le Roy Salsich as president and later with Rudolph Elstad at the helm, have given Mack Lake a free hand wherever and whenever he wanted it. This proved wise. A trip to downtown Ciudad Bolivar with Jim Olk; Chick Evans, American lawyer with Dr. Travieso, who likes it down here; Elmar Madisso; and Orville Uthus showed me that the whole town of Ciudad Bolivar is behind the Orinoco Mining Co. in every way possible from the dock workers to the top officials.

Headquarters at Ciudad Bolivar located a few miles from town is the latest in American efficiency. The houses for the men and visitors are built with a center living room and a sleeping room and bath at each corner. Houses for the families are built so that there is a porch, a living room, dining section, kitchen and bath.

Outside the headquarters where major domo of the routine and reports, George Matesha, holds forth is a monument made with some iron picked up near Cerro Bolivar. It is believed that it was cast when the Spaniards were in that area.

And now we say, as Hollie Hollensteiner, chief chemist and George Kniazolucki, camp geologist, says: "All we have to do is get the ore out." But with the same help from people in the States, people in Venezuela, people at the camp, there will be no more trouble getting it out than there was finding it. Maybe less. But this exploration will go down as one of the best planned and executed searches for ore that has ever been made.

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Production Casting
30-TON ENGINE BASES

Completed 2400 hp gas-diesel engine built by Cooper-Bessemer. Overall length is 30 ft, and total weight of the unit is 210,000 lbs.

By C. W. GILCHRIST

Foundry Supt., Cooper-Bessemer Corp., Mt. Vernon, Ohio

Significant data is presented on handling molds that exceed a foundry's crane capacity and drying oven size. Time required for making the mold was reduced from two weeks in the experimental model to two days in the final production setup by development of unique handling and drying methods.

ONE of the largest production castings jobs ever undertaken by Cooper-Bessemer Corp. is the 30-ton engine block casting shown in Fig. 1. This block is for a large gas-diesel engine developed by Cooper-Bessemer for pumping natural gas through the large pipelines connecting the natural gas fields of the southwest to the heavy industries of the middle west and east. The engine was designed when the company anticipated a need for a very large engine with greater horsepower per sq ft of floor space, making for economy of installation and building space.

The only limiting factor was facilities for shipping, so engineers at C-B designed an engine for the maximum capacity of the largest railroad flatcar available.

The foundry was faced with the problem of casting the engine base and frame. Casting in a pit would require a great amount of labor for digging out, as the completed casting would be too heavy to pull loose with overhead cranes. Calculation of the mold and pattern weight at first gave the foundry organization the impression that flask molding would be an impossibility.

Production demands on this casting would also require development of mold drying and handling methods that were both fool-proof and efficient.

It was decided to make a semi-production pattern, even though the first casting was to be for

an experimental engine only. Experience had shown that a pattern should never be made for running less than 50 pieces, since the difference in cost between a single casting pattern and a 50-casting pattern is not high enough to effect any great saving. Also it appeared that the engine would ultimately be built on a production basis.

The cost of flasks was prohibitive unless the engine actually sold in quantity, so pit molding was the method selected for the experimetal model. Two 17-in. I beams were fabricated into lifting beams and set into the bottom of the 10x12x28 ft pit, as shown in Fig. 2. After ramming and levelling, steel rails were set on the lifting beams and again air-rammed and leveled. Ram-up cores and the patterns were then set.

The pit was rammed by use of an overhead crane, grab bucket and air rammer. This was a time-consuming operation requiring much skill and care by the molder. After about six days, it was possible to make a parting at the top of the pit and set the cope. Another day was required to ram the cope and finish the mold.

FIG. 3—Pit mold after drying, ready for the body cores to be set.

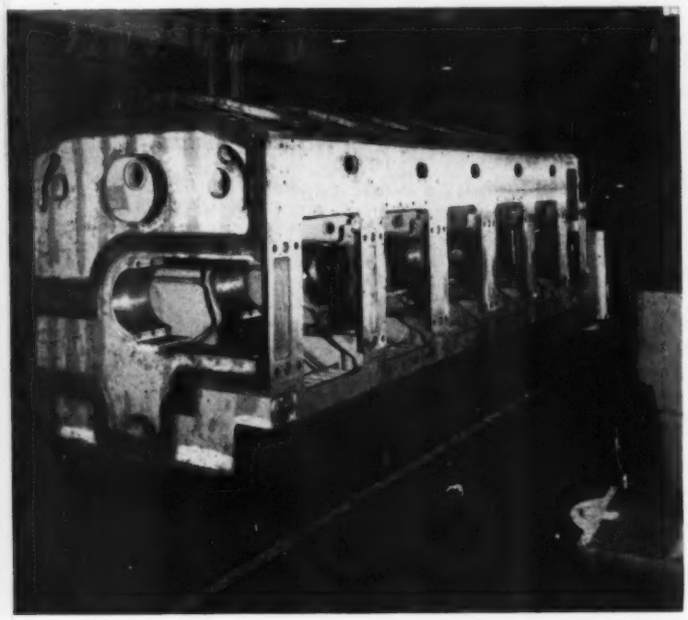

FIG. 1—The finished engine block casting, weighing about 30 tons.

The mold was dried for five days, using an improvised burner made by sawing slots in a pair of 2-in. pipes and hanging them close to the bottom of the mold, covering the mold with corrugated steel sheets. The cope was set on a rack and dried, using another set of burners and pipes made for the purpose. Fig. 3 shows the pit mold after drying. This process took more than two weeks.

Next, the 9-ton body cores that form the bearings, ribs, oil pan, and cylinder hold down bosses were placed. Total weight of cores used in the

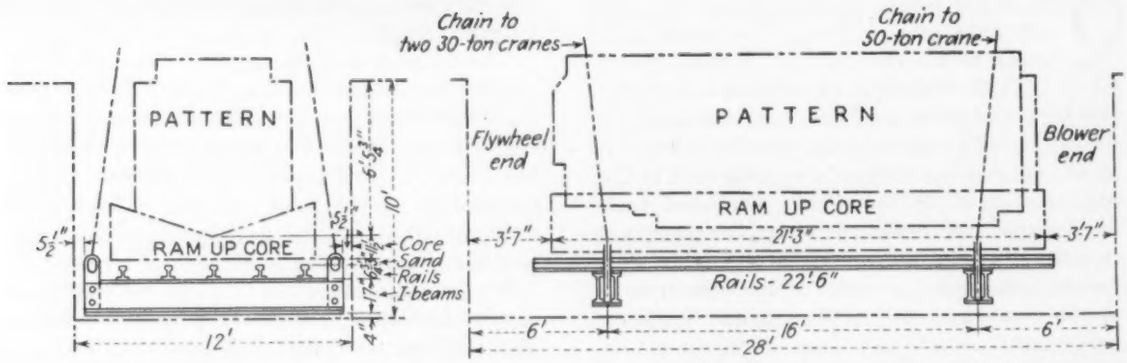

FIG. 2—Arrangement for pit molding the 32-ton casting. Note pairs of I beams assembled to form lifting beams.

FIG. 4—Setting one of the 9-ton body cores with an overhead crane. Total weight of cores in the mold is about 100 tons.

mold was approximately 100 tons. Fig. 4 shows setting of a large body core into the pit mold with an overhead crane. Variations in wall sections ranged from $\frac{5}{8}$ to $4\frac{1}{2}$ in.

In Fig. 5, all the cores are shown in place; a particularly good view of the runners and location of the down gates is afforded.

The cope was set in place and the casting poured, as shown in Fig. 6. Approximately a ton of iron was flowed off after the mold was full to insure a solid oil pan, which was cast in the cope. Pouring weight was about 32 tons.

The base was poured from Meehanite Process Iron with an analysis of 3.5 pct T C, 2.0 pct Si, 0.75 pct Mn, 0.20 pct P, and 0.10 pct S. Shrinkage predicted was 5/64 in. per ft, which is less than normal for this material. The calculation was made on the basis of past experience, as large masses of core seem to affect the solid shrinkage of Meehanite in similar designs.

Chromel-Alumel thermocouples were placed in silica tubes and put in representative sections such as a $4\frac{1}{2}$-in. bearing section, 4-in. cylinder hold down boss section, and various thin-walled portions. Thermocouple lead wire was carried out through prints in the cope. Cooling curves were recorded on all these sections, on the basis of which some slight modifications in design were made in areas where stress concentrations were set up, possibly due to differences in cooling rates.

The experimental engine proved successful and it became necessary to go into production on these large castings. If the cycle on a pit was to be 24 to 28 days, production of 6 to 8 bases per month would obviously require converting too much of

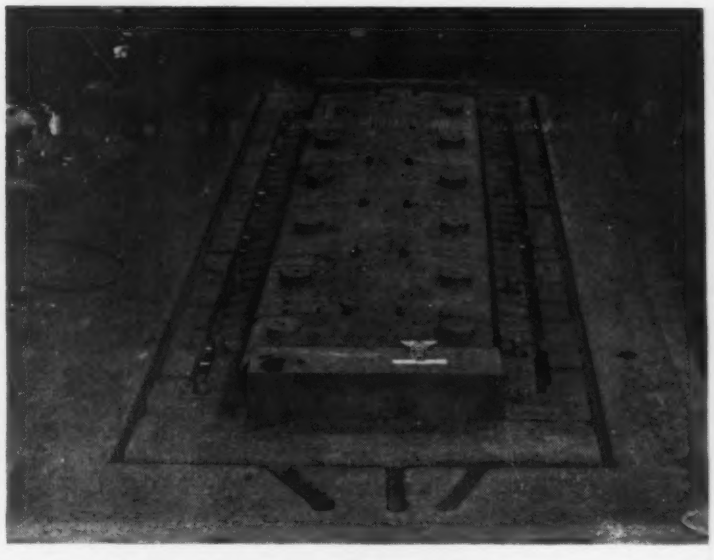

FIG. 5—All the cores in place, ready for the cope.

FIG. 6—Pouring the casting; 32 tons of metal were poured in 2 min 10 sec.

the foundry floor area to pits, and the engine frames were only a portion of the total production carried on. The pattern was therefore split in such a way as to allow the flask to be made in three pieces, consisting of a bottom drag, a cheek and a cope. The cope was matched to fit the same pattern plate as the drag. The cheek was arranged for dowelling to the bottom drag pattern after the drag is rolled over, as the maximum load that could be handled by the foundry's 75-ton crane was calculated to be a 60-in. drag section.

Fig. 7 shows the bottom drag set on the pattern plate and the Sand-slinger in ramming position, thus eliminating 32 hr of core time. This section was slung up, and bottom boards bolted into position. This half of the drag was picked up, set on a rollover chain and dumped on a sand pile, and then set into a pit with a leveled bottom; the pattern plate removed, and the cheek pattern and cheek flask set in position. The drag was then rammed up to joint as shown in Fig. 8.

The pattern plate thus becomes available for ramming the cope by the middle of the day, so the job that had taken seven or eight days in the pit with air rammers and crane grab bucket is accomplished in a single day. The Sandslinger makes possible the very small sand wall between the core prints and flask, as seen in Fig. 8.

The next problem was that of reducing the 5 to 6 day drying cycle. At this stage, the mold exceeded crane capacity, so drying in an oven was out of the question, and the 5 or 6 days required for drying with burners in the bottom of the mold rendered that method impractical.

A solution was found in using a portable recirculating-type mold drier with duct work designed to create a turbulant flow of hot air within

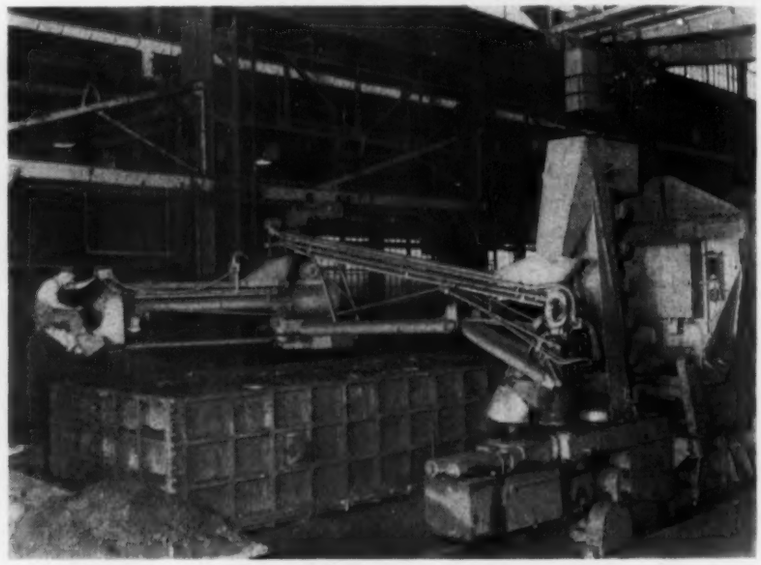

FIG. 7—Sandslinger in ramming position over the bottom drag.

FIG. 8—Completed drag and cheek assembly. Note the thin sand walls, made possible through use of the Sandslinger.

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FIG. 9—Spacer containing duct work for drying being lowered into the mold.

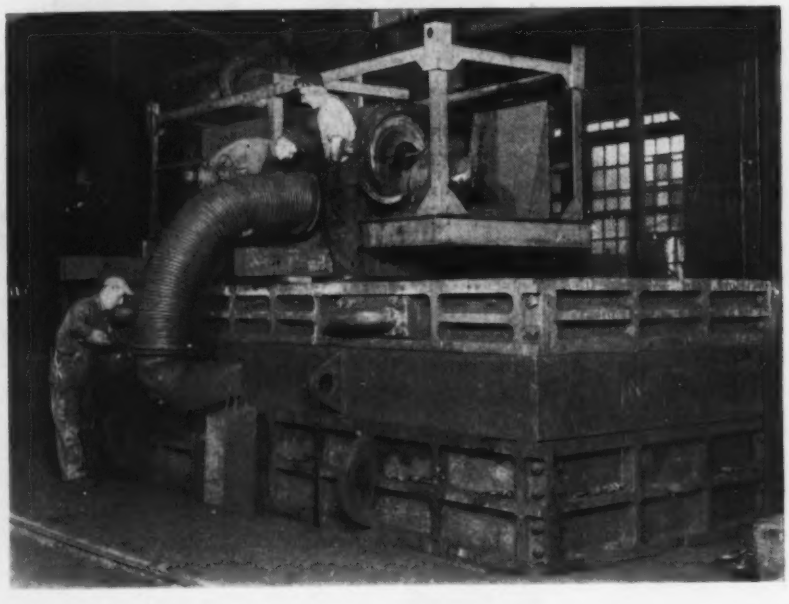


FIG. 10—The portable recirculating drier is connected to the duct work spacer, creating a recirculating oven from the mold cavity.

the mold cavity. Fig. 9 shows the spacer between cope and drag with duct work to direct the flow to heavy sections of the mold. The mold drier incorporates an automatic temperature control and a fan producing pressure of 3 to 4 oz, creating the desired turbulence and maintaining the temperature at 600°F, thus actually converting the mold into a recirculating oven, as shown in Fig. 10.

Approximately 20 pct of the air is bled off, controlled by placing bricks over part of the vents, sprues and flow-offs. This air is sufficient to remove the moisture, and the recirculated air maintains the high temperature necessary for drying the pitch compound sand. Drier capacity is 1 million Btu per hr. It was found that from 24 to 36 hr are adequate to dry the the 80 tons of sand in the mold. Another production mold with over half this volume of sand is dried overnight in the same manner, and has a skin dry of 8 in. min depth. Since it takes only two days to core up, the 8 in. skin dry is entirely satisfactory.

The mold is cored up and poured in much the same manner as the experimental model. The shakeout procedure is greatly simplified in that the casting does not have to be dug out of a pit. The cope is first removed, then the cheek; this exposes the heavy outer bolt holes in the cope side of the casting. The casting is simply lifted out of the mold at this point. The remainder of the flask is raised from the core-up pit and unbolted, and sand is removed with a clam shell bucket. Hard, unburned core prints are removed from the casting with a core buster and by washing with a Hydro-Blast.

With the addition of a Sandslinger, the use of flasks in place of pits, and the portable mold drier, the 32-ton casting can, if necessary, be rammed in one day and dried in two nights and a day, thus completing in two days the work that had required two weeks by methods used in casting the experimental model.

New Precipitation-Hardening Stainless Steels

Armco's two new steels, 17-4 PH and 17-7 PH, employ copper and aluminum as precipitation-hardening elements instead of carbide formers. These steels have excellent corrosion resistance plus high strength properties, which offers new applications for stainless. 17-4 PH is discussed in this, the first part of a two-part article.

By G. N. GOLLER and W. C. CLARKE, JR.
Senior Research Engineers, Armco Steel Corp., Baltimore

TWO new chromium-nickel precipitation-hardening alloys have been developed. These steels combine excellent corrosion resistance, high strength and hardness, and low temperature heat treatment. The alloys, known as Armco 17-4 PH[1] and Armco 17-7[1] stainless, represent a great advance in stainless steel metallurgy.

The two steels differ not only in general analysis but also in the precipitation-hardening element. Armco 17-4 PH uses copper as a precipitation-hardening element, while 17-7 PH employs aluminum, neither of which are carbide-forming elements. In this respect they differ markedly from other precipitation-hardening stainless alloys.

The development of precipitation-hardening chromium-nickel alloys has been the objective of many research workers for a considerable time. In general, the idea has been to develop an alloy which from a soft, ductile condition could be hardened by heating at a relatively low temperature, approximately 900°F. With this objective now accomplished on a commercial basis, the excellent corrosion-resistant properties of chromium-nickel alloys can be combined with the high elastic and strength properties of hardened straight-chromium steels, and even of the hardened high-carbon or low alloy carbon steels.

Among those who first attempted to produce such alloys were Kroll,[2] Wasmuht,[3] Bennek and Schafmeister,[4] Pilling and Merica,[5] and Ffield.[6] All these investigators either employed titanium as a precipitation-hardening element or else included titanium among the group of elements investigated as precipitation-hardening agents. During the war Germany developed for use as jet plane blading a precipitation-hardening alloy designated as "Tinidur."[7] This was a chromium-nickel alloy employing titanium as the precipitation-hardening agent. Wyche et al[8, 9] developed a precipitation-hardening alloy of the chromium-nickel type in which titanium or some other carbide-forming element produced the precipitation-hardening reaction.

This new stainless steel was developed primarily for bar and forging billet applications. A low temperature, 900°F, short time heat treatment gives 17-4 PH unusual advantages. Cracking, distortion, decarburization, scaling and similar problems encountered in high temperature heat treating are virtually eliminated. Parts can be completely machined before hardening, eliminating expensive finishing operations, and stress relief is not necessary. The mechanical properties of this new grade are comparable to those of hardened stainless types 410, 414, and 431. In addition 17-4 PH has a general resistance to corrosion greater than that of any of the standard hardenable stainless steels; it approaches that of type 304.

The following chemical analysis is typical for Armco 17-4 PH: C, 0.05; Cr, 16.5; Ni, 4.0; and Cu, 4.0 pct.

This steel is usually supplied in the annealed or solution-treated condition but also may be obtained in the hardened condition. Annealing consists of heating between 1800° to 1850°F for one-half hour and air cooling or oil and water quenching, depending upon size and shape of the material. It is recommended that sizes over

approximately 1-in. diam as well as intricate sections should be air cooled to minimize the possibility of quench cracking. After fabrication the final hardening consists of heating at 900°F for 1 hr and air cooling.

Armco 17-4 PH is substantially austenitic at the annealing temperature; but on cooling below approximately 250°F, it transforms into a mixture of austenite and martensite. This transformation gives only a partial hardening because of the low carbon content of the martensite. However, the martensite is supersaturated with copper and at 900°F a highly dispersed copper-rich phase precipitates. This copper-rich phase gives the comparatively high hardness of the fully treated alloy.

Typical Mechanical Properties

The influence of the temperature and time of the final precipitation-hardening treatment on the hardness of 17-4 PH is shown in Fig. 1. These data show that higher hardnesses are obtained at 800°F and 850°F. Recent work indicates that the trends shown for the 800°F and 900°F treatments may be safely extrapolated to 500 hr. If it is desired to harden this grade rapidly the recommended practice is ½ to 1 hr at 900°F. Above this temperature the hardness level of Rc 40 to 45 is never quite reached, probably due to rapid stress relief of the matrix.

TABLE I

MECHANICAL PROPERTIES OF ARMCO 17-4 PH

	Annealed 1800°F-1900°F ½ hr AC	Hardened 900°F 1 hr AC
Ultimate tensile strength, Psi	135,000 to 165,000	190,000 to 210,000
Yield strength, 0.2 pct, Psi	95,000 to 125,000	170,000 to 200,000
Proportional limit, Psi		115,000 to 140,000
Elongation pct in 2 in., pct	6 to 15	6 to 15
Hardness, Rc	30 to 35	40 to 45
Brinell hardness	300 to 400	375 to 440
Izod impact, ft-lb		10 to 20
Modulus of elasticity, Psi		28,500,000

Overaging occurs rapidly at 950°F and higher. Typical mechanical properties appear in Table I.

Notch impact toughness somewhat higher than that shown in Table I has been obtained by using a hardening temperature above 900°F but with a slight sacrifice in tensile strength and hardness. Table II illustrates the extent to which properties are altered by varying the hardening temperature.

The fatigue strength of this grade is being thoroughly studied. Based on the results to date, it does not appear to have a definite endurance limit. The data indicate that the stress at which the steel will endure 100,000,000 stress reversals is between 75,000 and 80,000 psi. At 10,000,000 cycles the stress is approximately 85,000 to 90,000 psi.

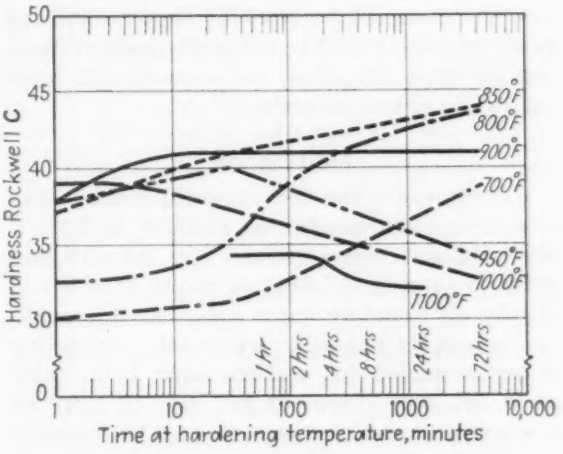


FIG. 1—The influence of precipitation hardening temperatures and times on the hardness of Armco 17-4 PH.

The torsional properties for 17-4 PH are shown in Table III. These are high enough to be of great interest to manufacturers of heavy coil springs, especially in view of the unusually good corrosion-fatigue properties of the material.

Short-time, elevated temperature tensile and hot hardness data at temperatures up to 1200°F are shown in Table IV. Further testing to determine stress-rupture, creep, and relaxation properties is underway. Experience indicates that it is safe to use the tensile properties in designing for applications involving exposure at temperatures up to 600°F.

Various physical properties of the alloy in the annealed and the hardened conditions are shown in Table V. The increase in density, decrease in electrical resistivity, and decrease in size after the hardening treatment are typical of the behavior of precipitation-hardening alloys.

The corrosion resistance of 17-4 PH in all conditions approaches that of type 304 and is superior to that of the standard hardenable stainless steels of the 400 series. This statement is based on comparative results obtained on test specimens exposed to the marine atmosphere, sea water at Kure Beach, and a mild industrial

TABLE II

INFLUENCE OF VARIOUS HARDENING TEMPERATURES

On Mechanical Properties of Armco 17-4 PH

Condition	Ultimate Tensile Strength, Psi	0.2 Pct Yield Strength, Psi	Elong. 2 in., Pct	Red. of Area, Pct	Rockwell C Hardness	Izod Impact, ft-lb
Annealed + 900°F 1 hr AC	196,000	182,500	15.0	47.0	42	15
Annealed + 1000°F 1 hr AC	171,000	160,000	16.0	54.5	37	28
Annealed + 1100°F 1 hr AC	155,000	148,000	15.0	57.5	35	36

Continued

atmosphere at Middletown, Ohio. The same relation was found to exist in various pitting tests and during exposure to fruit juices, salt spray, etc. Tests completed to date indicate the general level of corrosion resistance, but an extensive program is underway to obtain corrosion rates in specific media. Other preliminary tests indicate that this alloy has exceptionally good corrosion-fatigue properties.

Fabrication

Hot forging of the steel is readily done. Blanks should be uniformly heated at 2150° to 2200°F and held at temperature not less than 15 min prior to forging. If finished above 1800°F and rapidly air cooled or water quenched it is possible to omit the annealing treatment. Air cooling is recommended for sections over 1 in. thick or of intricate shape. In the case of large or intricately shaped forgings, it may be desirable to transfer them directly from the hammer to the annealing furnace.

Machining characteristics of 17-4 PH in the annealed condition are similar to those of type 410 stainless in the hardness range of 280 to 320 Brinell. For equal hardness the tool life for type 416 and 17-4 PH is the same. Machining rates of 40 to 60 sfpm are recommended as a safe range. Several shops have made parts satisfactorily at 80 sfpm in automatic screw machines. An excellent surface finish is obtained when machining this grade. The alloy is also machinable in the hardened condition but at rates approximately 40 pct below those for annealed material.

Welding properties of this grade are excellent. It possesses all the desirable welding characteristics of the tough, ductile 18-8 grade and none of the undesirable welding characteristics of the conventional hardenable chromium grades. The alloy can be joined by all welding processes regularly used for stainless steels.

Preheating is not required for welding because the weld joints display neither tendency to harden nor unusual susceptibility to cracking as a result of welding. In the heat-affected zone of the base metal, the area immediately adjacent to the weld is annealed by the thermal effects of welding. In the lower-temperature portion of the heat-affected zone little or no precipitation-hardening takes place because the thermal cycle of welding is generally too short.

Another important fact is that the fusion metal or weld deposit can be hardened by the same simple heat treatment used for the parent material. For fusion welding, filler rod as well as coated arc-welding electrodes are available in the 17-4 PH composition. If it is unnecessary to have weld metal of a precipitation-hardening composition in the joint, then a filler rod or electrode of regular austenitic chrome-nickel stainless steel, such as type 308, can be used.

A matter of practical interest in fabricating 17-4 PH stainless is the sequence of the welding and heat treating operations. Experience shows that when it is welded in the annealed condition

TABLE III

TORSIONAL PROPERTIES

Armco 17-4 PH

Ultimate strength, Psi	160,000 to 180,000
Elastic limit, Psi	80,000 to 110,000
Modulus, Psi	10,500,000
Hardness, Rc	40 to 45

TABLE V

PHYSICAL PROPERTIES

Armco 17-4 PH

	Annealed	Hardened
Density, G per Cc	7.78	7.80
Electrical resistivity, Microhm per Cm	98	77
Magnetic permeability, at		
100 Oersteds	74	100
200 Oersteds	48	60
Maximum	95	151
Thermal coefficient of expansion (in. per in. per °F) x 10^{-6}		
70–200°F	6.0	6.0
70–400°F	6.0	6.1
70–600°F	6.2	6.3
70–800°F	6.3	6.5
Dimensional stability: 0.00047 in. per in. contraction upon hardening		

TABLE IV

HOT HARDNESS

Short Time High Temperature Mechanical Properties and Hot Hardness of Armco 17-4 PH

Test Temp., °F	Ultimate Tensile Strength, Psi	0.2 Pct Yield Strength, Psi	Elong. in 2 in., Pct	Reduction of Area, Pct	Brinell Hardness
Room Temp.	196,000	182,800	15.0	47.0	407
400	...	...	...	...	390
500	170,000	150,000	10.0	34.0	360
700	158,000	138,000	10.0	34.5	348
800	157,500	137,500	10.0	24.0	330
900	140,000	110,000	10.0	33.0	277
1000	99,000	74,500	15.0	46.5	212
1200	58,000	43,000	15.0	61.0	131

TABLE VI

TYPICAL MECHANICAL PROPERTIES OF WELDED JOINTS

Armco 17-4 PH Stainless Steel Prepared by Metal-Arc Process or Inert-Gas Shielded-Arc Process[2]

	(A) Hot Rolled, Annealed, Hardened (Unwelded)	(B) Hot Rolled, Annealed, Hardened and Welded	(C) Hot Rolled, Annealed, Welded and Hardened	(D) Hot Rolled, Welded, Annealed and Hardened	(E) Hot Rolled, Annealed, Hardened, Welded and Hardened
Hardness: Rc					
Parent metal	43	43	43	43	43
Weld metal	.....	30	44	43	45
Ultimate tensile strength, Psi	200,000	150,000	185,000	195,000	185,000
Elongation, pct in 2 in.	10.0	5.0	6.0	5.5	7.2
Location of fracture	.....	Weld metal	Weld metal	Weld metal	Either weld metal or heat-affected zone
Efficiency of weld joint, based upon tensile strength, pct	.....	75	92	98	92

[1] Double-bevel butt-joints in ¼ in. thick plate prepared by metal-arc welding with 5/32 in. size flux coated electrodes of Armco 17-4 PH Stainless Steel.
[2] Square-butt joints in ¼ in. thick plate prepared by argon-shielded tungsten-arc welding using one pass on each side and adding no filler metal.

and subsequently hardened, the weld efficiency is approximately 92 pct. If the weld joint is reannealed after welding and then hardened, weld joint efficiency is increased to about 98 pct. Untreated welds in previously hardened material will have an efficiency of about 75 pct, but this can be increased to the higher values by rehardening or reannealing and hardening. Table VI shows the mechanical properties of welds in which the order of welding and heat treatment has been varied.

Weld Properties after the metal-arc process, using coated Armco 17-4 PH electrodes, are closely comparable to those of welds made by the inert-gas shielded-arc process. The hardness and strength of the fusion weld metal in the as-welded condition (B in Table VI) are somewhat below that of fully hardened parent metal (A). However, normal hardening of the weld metal is obtained by applying the annealing and hardening treatments after welding (D). The results obtained by hardening alone after welding (C) are probably satisfactory for most purposes. If fully hardened material is welded, a hardening treatment at 900°F will bring the properties of the weld joint (E) close to those of the parent material. The additional hardening treatment will not harm the structure or properties of the already hardened parent material.

Cleaning and Finishing

Normal stainless steel pickling procedures using 20 pct sulfuric acid and 10 pct nitric-2 pct hydrofluoric acid are satisfactory for pickling 17-4 PH stainless steel after annealing. The sodium hydride method may also be used, provided a temperature of 750°F and a time of 15 min are not exceeded.

The light discoloration or heat-tint resulting from the 900°F precipitation-hardening treatment is readily removed by a 10 pct nitric-2 pct hydrofluoric acid solution at 110 to 140°F. Two to three minutes are usually sufficient for complete removal. Too long a time will etch machined or polished surfaces. Electropolishing or mechanical polishing with a fine abrasive are also effective in removing the discoloration.

It is possible to make both sand and precision castings of Armco 17-4 PH. The combination of good mechanical properties and excellent corrosion resistance of this alloy fills a gap in the stainless casting field. It contains no highly oxidizable element, like titanium, and has the same casting characteristics as types 302 and 304. The low temperature hardening treatment is also very desirable for castings which must be machined prior to hardening. Typical mechanical properties for heat treated 17-4 PH castings are:

Ultimate Tensile Strength psi	0.2 Pct Yield Strength Tension Psi	Elong in 2 in., Pct	Reduction of Area, Pct	Hardness
180,000	150,000	3.0	5.0	41 Rc

Potential Applications

Armco 17-4 PH is an extremely versatile alloy, and projects to date give promise that its applications will cover a broad and varied field. Its widest use undoubtedly will be where superior corrosion resistance combined with relatively high hardness and strength are desired. But there will be many applications where its freedom from scaling, distortion, and cracking during the hardening treatment will be determining factors in its use.

A product now in commercial production is an unusually long valve stem. Before 17-4 PH was used, one of the major problems had been distortion as a result of heat treatment. The properties of this new stainless also make it suitable for many aircraft applications. It is already being used for 13 parts of two vital airplanes, the B-45 and AJ-1.

A partial list of potential applications includes: Gears, cams, pinions, chains and other machined and hardened parts—especially in the food and chemical industries; valve plugs, seats and stems; shafting for pumps propellers, mixing equipment and instruments.

References will appear in Part II next week.

Cutting Oil Reclamation Pays Off

By STEPHEN BAUR
Assistant Editor
THE IRON AGE

Complete cutting oil reclamation and purification systems pay for themselves in 1 to 3 years. Units combining oil cleaning and dry chip preparation save oil and man hours and prolong tool and machine life. Clean chips bring higher scrap prices.

CUTTING oil purification installations in metalworking plants produce substantial yearly dollar savings through quantities of oil reclaimed, man hours saved, increased tool and machine life, and higher scrap prices paid for clean, dry, crushed chips. Complete installations usually include dry chip preparation setups integrated with centrifugal oil purification systems. Most installations of this type pay for themselves within one to three years.

The cutting oil consumed during a normal 8-hr production day in operations such as boring and turning, threading and tapping, drilling and reaming, milling and broaching, shaping and planing, and honing and grinding must be free from impurities for best results. Only through use of oil of the highest purity can producers achieve longer cutting tool life, increased production, closer tolerances, better surface finishes, longer machine tool life, less oil replacement, and

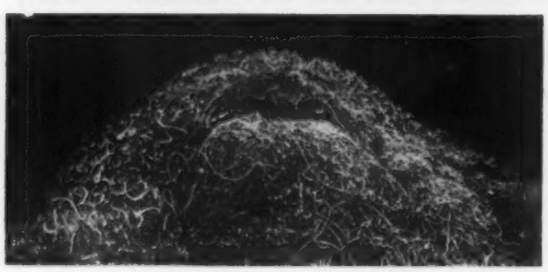
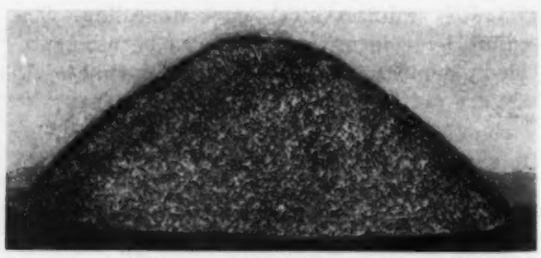


FIG. 1—A—Metal turnings coming directly from the machines, as shown above, cannot be properly handled in the extractor because of their bulk.



B—After being processed through the crusher, the metal turnings emerge as chips that can more easily be spun free from oil in the extractor.

greater operator protection. Metalworking producers, realizing the importance of clean cutting oils, utilize various filtering and sediment catching techniques for this purpose.

A system built around a centrifugal oil purifier has proved effective in removing impurities. Cutting oil processed through a system such as this emerges free from dirt, moisture, sand, sludge, and small metallic particles, and is immediately ready for re-use. This system also kills the bacteria that cause skin irritation and inflammation.

A typical installation of this type is the purification and chip handling system recently designed for the American Bosch Corp., Springfield, Mass., by National Chipveyors Co., Inc., New York, a firm specializing in cutting oil purification and dry chip preparation. The individual needs of the American Bosch plant set the performance requirements of the proposed purification system. The plant engineer, after consultation with these specialists, presented to American Bosch executives cost and performance figures that indicated the installation could be amortized within three years. The installation, now just passing the two year mark, shows that the forecast of savings was realistic and is being met. The complete setup consists of the oil purifying system and the dry chip preparation system.

The manufacturing operations are such that only one type of general purpose cutting oil is used. Of the raw stock consumed, steel is predominant over bronze and aluminum. The banks of production machines produce turnings that contain appreciable amounts of cutting oil. To bring the best price, this scrap must be in the form of dry chips.

Material Handling

The dry chip preparation system consists of a metal turnings crusher, an oily chip storage hopper, a dry chip floor hopper, and a pneumatic chip conveyor, in addition to the extractor unit already installed. The metal turnings crusher, driven by a 25-hp motor, takes in oily metal turnings and crushes them to a uniform chip size. The crusher has a capacity of 3000 lb of chips per hr. Metal turnings coming from the machines, as shown in Fig. 1A, are not in a form that lends itself to the efficient removal of oil in the extractor. Unprocessed turnings can be handled by the extractor, but oil recovery is only about 40 to 45 pct and extractor loads are reduced upwards of 50 pct. After being processed in the crusher, metal turnings emerge as chips.

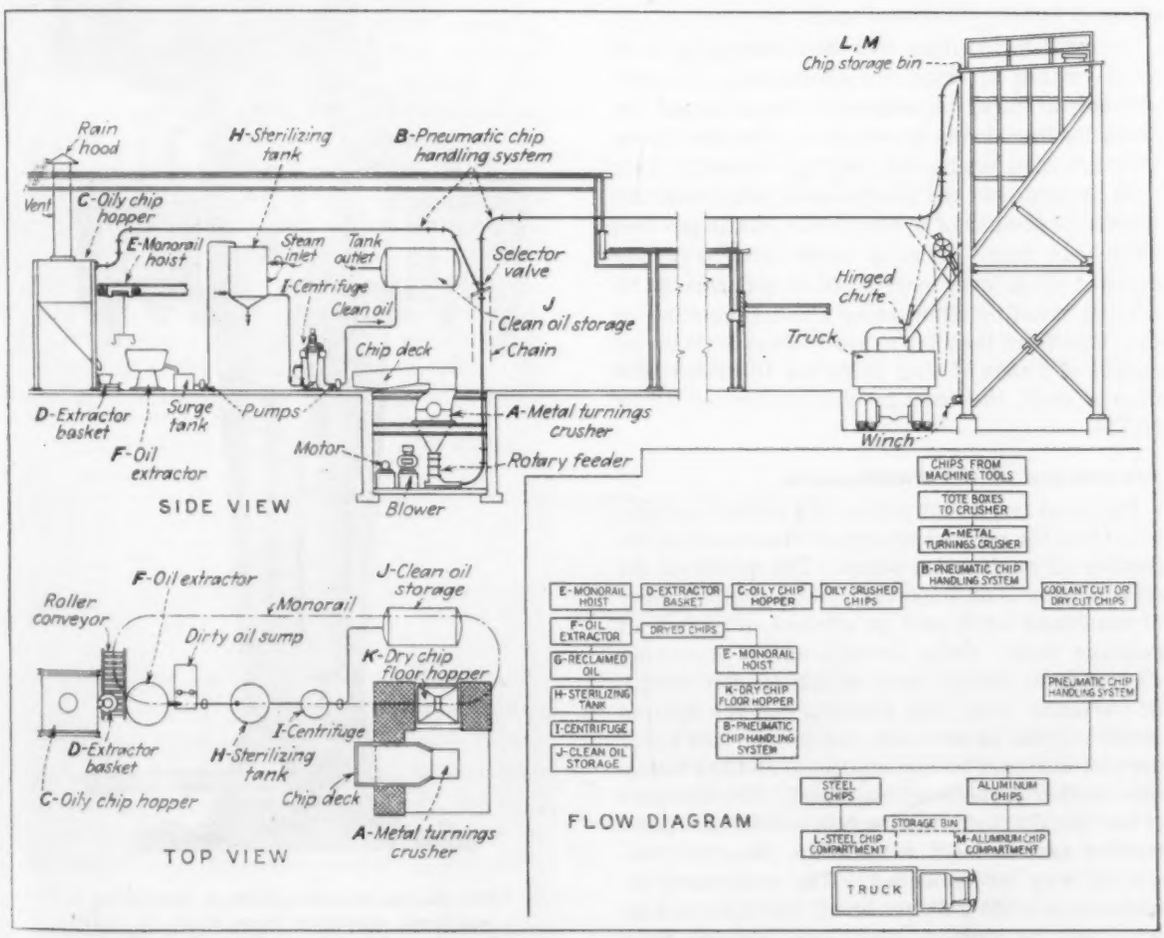


FIG. 2—The complete oil reclamation system consists of chip preparation machinery coupled with an oil purification setup. The chip preparation items are A to F, and K to M. Oil purification items include G to J.

Fig. 1B, and are ready for oil removal. When run through the extractor in this form, up to 98 pct of the oil is reclaimed from 1000-lb loads.

Steel turnings collected at the machine tools are delivered in tote boxes to the crusher chip deck, see Fig. 2. They are processed in the crusher, A. The oily chips emerging are pneumatically conveyed, B, to the oily chip hopper, C. They are unloaded from the hopper in 1000 lb loads to the extractor basket, D, and then carried by monorail hoist, E, to the oil extractor, F. Reclaimed oil flows into the dirty oil sump along with used oils from the machines.

This chip preparation system permits the efficient operation of the centrifugal oil extractor. As a result, approximately 40 gal of oil per ton of steel chips, or 200 gal per day are now being recovered.

One man can crush chips, extract oil, and deliver chips to storage, eliminating one man per shift. Crushed oily chips are automatically delivered to the storage bin by a conveyor, eliminating the need for chip handling, and correcting the nuisance caused by dripping oil and spilled chips in factory floors and yard.

Ground storage bins and the inconveniences of yard loading of chips are eliminated. Crushed dry chips, stored in overhead bins designed for truck loading, bring a premium price over those that are oily, uncrushed and unprepared. Cost data presented in the first proposal conservatively estimated savings of approximately $4.50 per ton. This was based upon a $2.00 advantage for crushed chips over uncrushed chips, plus $2.50 per ton saved by eliminating manual handling of the chips from the shop to yard storage. With an output of 5 tons of steel chips per 16-hr day, 300 days a year, the savings were estimated to be $6,750.

Advantages of Oil Purification

The most important part of the overall installation from the production output standpoint is the cutting oil purification setup. The purity of the oil emerging is an important factor in the quality of machined work and in efficient operation of machine tools. Only through use of a cutting oil free from sludge, sand, moisture, dirt, metallic particles, scale, and bacteria can the desired surface finish be attained, the proper cooling of the tool and part be accomplished, and the necessary worker protection be assured. For this part of the installation a high speed, centrifugal purification system built around the Sharples centrifuge was recommended. The equipment installed was a 500-gal cutting oil sterilizer, a 500-gal clean oil storage tank, two 100-gal floor sumps, the centrifuge, and all necessary piping, pumps, motors, and controls.

This system has the capacity to sterilize and purify for re-use 1000 gal of cutting oil in 16 hr. The dirty oil from the dirty oil sump, is pumped to the 500-gal sterilizing tank, H. The sterilizer heats the oil at temperatures of 180° to 200°F. A valve is provided at the bottom of the sterilizer to permit the operator to draw off the sludge.

After sterilization, the oil flows into a high speed Sharples centrifuge, I. This machine removes the remaining water, and any other impurities the oil might contain. The water, sludge and fluid impurities are discharged to a sewer, and the clean oil is discharged to the surge tank. Clean oil in the surge tank is pumped through pipes to the 500-gal clean oil storage tank, J. Oil in the surge tank can also be pumped directly to the machines through distributing lines. All solid impurities such as dirt, sand, scale, metallic particles that have been removed from the oil

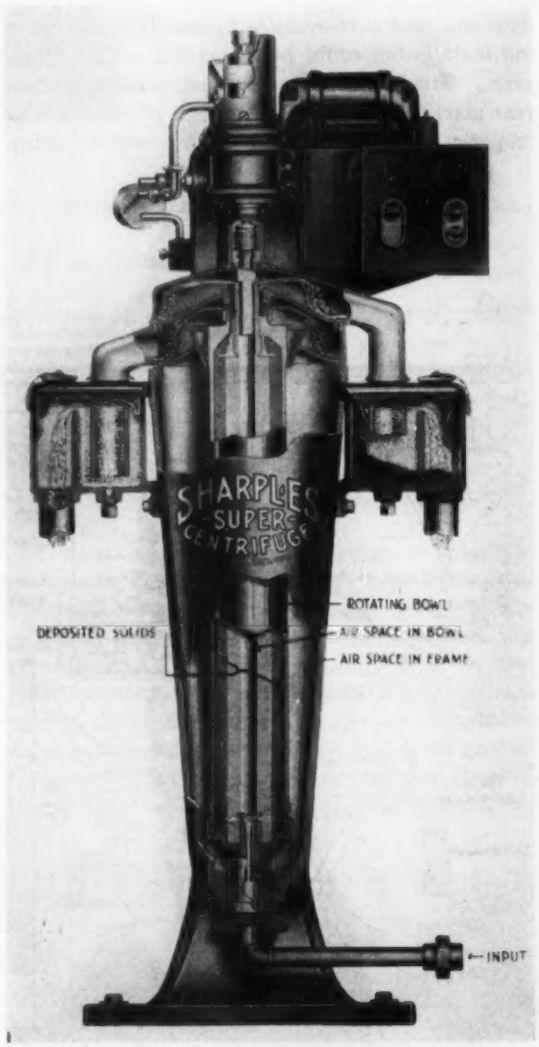


FIG. 3—The Sharples centrifuge, developing a centrifugal separating force equal to 13,200 times the settling force of gravity, settles out solid particles along the side of the spinning bowl, and discharges clean oil to surge tank and water and other fluid impurities to sewer.

Advantages of Centrifugal Oil Purification

LONGER CUTTING TOOL LIFE—	Abrasive particles that dull edges of cutting tools are removed from the oil.
INCREASED PRODUCTION—	Less time is lost in removing cutting tools for redressing and sharpening.
CLOSER TOLERANCES—	Clean oil reduces tool wear and avoids abrasion of finished part.
BETTER FINISHES	Clean oil avoids the possibility of part scratching.
LONGER MACHINE TOOL LIFE—	Less wear on spindle, bearings, ways, cams and other bearing surfaces.
LESS OIL REPLACEMENT—	Contaminated and dirty oil is thoroughly cleaned and sterilized for re-use.
OPERATOR PROTECTION—	Bacteria is removed by sterilization.

by centrifugal force, are deposited along the full length of the inside diameter of the centrifuge bowl, as shown in Fig. 3.

Utilizing the basic theory of gravity settling the centrifuge steps up the settling out action of particles through the use of the highest separating force commercially available. The bowl, or rotating chamber, revolves at 15,000 rpm, subjecting the oil to a centrifugal separating force of 13,200 times the settling force of gravity. Dirty oil is fed in at the bottom of the centrifuge and jetted into the revolving bowl. The enormous centrifugal separating force throws out from the oil the fine metallic particles, abrasive impurities, and moisture that will not settle by gravity and that will pass through screen or filters. The purified oil and the separated water discharge continuously from the outlets in the top of the bowl into separate covers. The clean oil is piped to storage or back into the system and the water, if present, is run to waste.

The solid particles that are separated from the oil are collected on the inside of the removable bowl. The machine can be stopped, the dirt cake removed from the bowl, and the machine started again in approximately 20 min.

The complete installation of the purification and chip processing equipment cost the American Bosch Co. in the neighborhood of $21,000. Cost figures show that during the first year of operation, on a 16-hr shift, the savings realized were slightly more than 50 pct of the initial cost. A drop in the overall activity of the plant during the second year of operation brought the saving down to a little less than one-half of the initial cost, the total savings over the two year period still amounting to enough to completely amortize the initial investment.

NEW BOOKS

"Improving the Efficiency of Packaging Production." Pamphlet contains papers presented at the spring Packaging Conference and Exposition, 1949, covering such subjects as profitable development of automatic machinery, reducing costs through flexibility in production, getting the most out of machinery for films, the short-term outlook for packaging materials, and coordinating packaging, production and sales. American Management Assn., 330 W. 42nd St., New York 18. 75¢. 40 p.

"Transformer Principles and Practice," by J. B. Gibbs. Second edition, dealing with all aspects of the construction and use of transformers, including underlying principles, applications, connection, testing, care, and economics. Descriptions of many particular types of transformers are given, and transformer connections, phase transformation, polarity, ratio, adjustment, mechanical forces, and other aspects are dealt with in detail. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 18. $3.50. 232 p.

USE OF MOLYBDENUM WIDENS

A new production technique of larger ingots permits wider application of molybdenum

A. B. Lovett and W. M. Fraser of the Chemical-Metallurgical Dept., Westinghouse Lamp Div., Bloomfield, N. J., exhibiting the products made at that plant from the new type molybdenum ingot, the sheet held by Mr. Lovett weighs 5 lb. The long bar is rod stock used in electronic tube construction.

APPLYING conventional steel mill practices at the Park works of the Crucible Steel Co. of America, Pittsburgh, to ingots formed by a new method, engineers of Westinghouse Lamp Div., Metallurgical Section have developed molybdenum rod, plate, and sheet fabricating technique.

Because of the high melting point of the metal, the usual practice in forming ingots in the industry has been to press molybdenum powder in a steel mold employing huge hydraulic presses, and then to pass high electrical currents through these green-pressed ingots. Obviously, the size and shape of ingots is limited in this method by the enormous pressures required and by mold design. Another limiting factor is the equipment required to pass current through the green-pressed ingot in order to obtain a sound ingot prior to attempting fabrication.

By means of a new method of preparation, ingot sizes many times greater than heretofore possible are made. The average ingot weight by this process is 50 lb. Slab ingots for plate and sheet rolling or rounds for rod rolling are readily formed. The green-pressed pieces are surface-conditioned and then treated by a special high temperature process.

The round ingots are used for rolling rod stock, from 1⅝ in. diam to ¾ in. diam, by continuous rolling. One heating operation is used in the steel mill, rather than by the usual practice of using numerous reheats and swaging through numerous dies to effect such a reduction in diameter. Rod stock is the product required for wire-drawing operations, as well as being used as such in electronic tube construction.

The slab ingots are used for rolling large molybdenum plate ⅜ in. x 14 in. x 18 in., for use as electrodes in new furnaces being constructed by several of the leading companies in the glass industry. These ingots are also used to roll light gage wide sheet finishing 0.020 in. x 24 in. x 44 in. A high surface luster may be imparted to this sheet through use of endless belt polishing machines as used for polishing stainless steel sheets.

The rolling and fabricating facilities required for production of molybdenum rod, plate, and sheet in sizes as mentioned in this article are far larger and more powerful than presently existing in the molybdenum industry. Application of conventional steel mill practices to molybdenum prepared under the new method has served to place this metal on a favorable economic and practical basis previously believed unattainable.

High-temperature physical test data such as stress-rupture and creep, now being obtained, may lead to possible uses of molybdenum in jet engine and guided missile construction. If such is the case fabricated molybdenum may play an important role in future defense plans.

British Use
HIGH WALL COKE OVENS

By D. BAGLEY
Donald Bagley, Limited, London, England

Foreign use of higher wall ovens than used in this country offer some advantages. Better thermal efficiency and higher production is claimed. Firing methods of the Still oven are given in detail.

AMERICAN coke plants and coking practice are rated as good as that found anywhere. American equipment, however, is different than some of that found in other industrial areas in England and Europe. In this sphere larger ovens than usual have been employed to obtain higher coke production through the use of *Still*-type coke ovens. The major differences between this oven and standard Koppers and Wilputte types is that the Still ovens are higher and the method of carbonizing the fuel is not the same as American practice. One reason for the variation in practice is that many British ovens still charge relatively high volatile coal while American practice is based on blends of low and high volatile.

For some time now American capacity seems to have halted at about 20 to 24 tons of coal per oven per day. Chamber dimensions on these ovens average 40 ft long x 13 ft high x 18 to 19 in. wide with a taper of 3 in. on the wall. The Still-type oven is 41 ft long x 19 ft 8 in. high, with an average width of 17¾ in. and a taper of 2 in. On a 20 hr coking time, the Still ovens will carbonize 37 net tons in 24 hr. This production can be increased by a reduction of the coking period to coincide with the American limit, because the Still ovens can be forced without any danger to the refractory material.

American mills report that they carbonize about 20 net tons per day based on their present blended charge. Assuming the same service per oven, it is believed that a considerable reduction in labor charges per unit of coke can be obtained with a larger oven. Also, the thermal efficiency must improve by reason of comparatively less radiation and conduction.

When the velocity of the crude gas is speeded up in the gas chamber of the larger oven, decomposition is avoided. Recently a customer using Still ovens of both 4 meter and 6 meter sizes stated that they were obtaining an increased oven yield and from 15 to 20 pct more benzol and tar from the same coal in the higher oven.

Ed. Note: This is to be expected as longer coking time generally produces a higher production of byproducts. Standard American coking time practice is 16 hr compared to the British practice of about 20 hr.

Coke costs under conditions in Britain approach 50¢ per gross ton of coke, if only 10 pct increment is allowed for in the byproducts recovered. By obtaining a thermal efficiency of 80 pct in lieu of the customary 72 to 75 pct and without crediting any advantage gained from reduced labor costs or the enhanced yield of good coke, operators in this country expect to gain about $500,000 per million tons of coke produced annually.

About 2,204,000 net tons of coal are carbonized annually in the Still-type ovens, some of which were built over 20 years ago. To some degree the Americans have been apathetic toward this type of oven and one reason is that in the past they have experienced difficulty in uniformly heating high wall ovens. The temperature variation over the complete oven wall of the Still oven

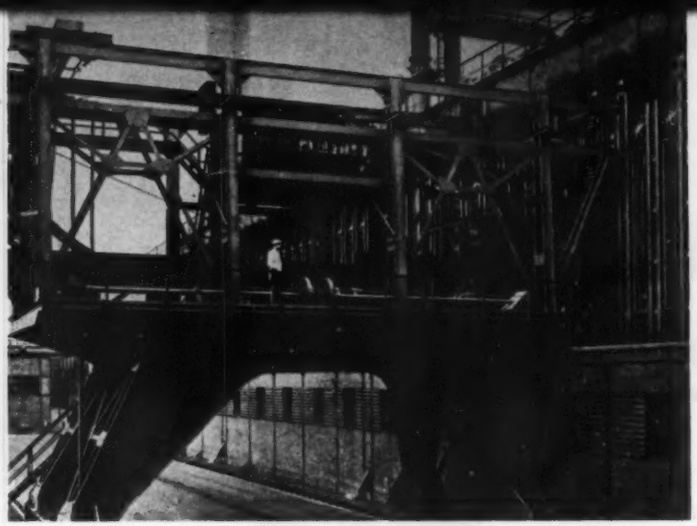


FIG. 1—Ram side view of Still ovens.

High Wall Coke Ovens

Continued

shows a variation of less than 30°C in any direction and this implies uniform carbonization. The even heat is achieved by multi-stage or stepped combustion using either coke oven, blast furnace or generator gas. All gas nozzles and air ducts must be exactly computed from practical experience, and this actually represents a high investment in research without which the accurate design fails. It also enables complete control of an oven battery at two points only in lieu of the many hundreds of dampers, regulating cocks, etc.

Fig. 1 is a general view of the ram side of the 19 ft 8 in. high Still ovens. Clay luting is completely avoided as a self-sealing door is used. The success of the self-sealing door is largely the result of design of the oven and the means adopted for compensating movement in the refractories. Still ovens employ heavy helical springs at three points on each side—roof, oven-sole and base.

The British coal larry is fitted with a number of independent chimneys corresponding to the number of charging chutes. Chimneys are now being designed for the coal larrys of American ovens. A small jet of compressed air is introduced into the chimneys, which both aids the evacuation of smoke and dust and the combustion of the exeunt gases in the vicinity of the chimney outlet. This avoids the contamination of the ambient atmosphere making the charging operations smokeless. A full charge of 31 net tons is uniformly distributed within the oven chamber in less than 1 min. This system has been used in the Still oven for 15 years.

The Still oven can be constructed either on the underjet or side jet principle. The underjet is popular because exact gas regulation can be achieved when employing oven gas and the same control is extended to the use of low grade gases such as blast furnace gas. The oven is compound, permitting the choice of either heating media. Side jet firing can be deleteriously influenced by carbon formations choking distribution duct and gas nozzles. Operators in this country favor the side jet type because with the special gas flue and insulating devices, carbon formations in the ducts and nozzles are precluded. This type of construction allows reduction in expenditure as control passages beneath the ovens are not needed.

FIG. 2—Cross-section through the battery at left. Detail at right is a longitudinal section through the wall.

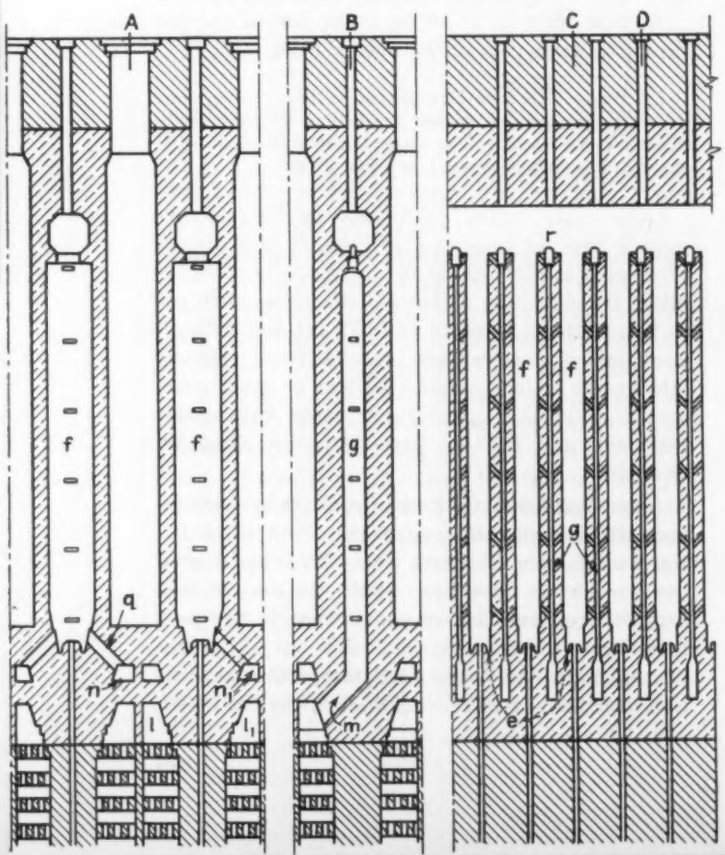


Fig. 2 depicts the method of firing of the Still oven. The cross section on the left is a section through the battery while the cross section on the right is a longitudinal section through the wall. Sections *A* and *B* show the heating flues *f*, *f*, with the oven chamber between. *G* is a section of the duct in the division walls separating the flues. *A* is taken on line *C*, and *B* on line *D*. Here the multi-stage combustion system only is shown but it is applicable to either under or side jet ovens. When operating with oven gas all the gas issues from the nozzles *e*. The pre-heated combustion air enters the ducts *g* contained in the flue divisions and emerges at six points on either side so graduated that predetermined heat quantities are liberated at these points in the vertical direction.

In substituting blast furnace gas, one duct, *g*, conveys the heating media, and the duct in the adjoining flue division conducts pre-heated air. This gives complete combustion in contradistinction to graduated combustion, featured at each of the six superposed points first mentioned. Any number of ovens may simultaneously operate on low grade and oven gas with this system, and the changeover from one gas to the other takes but a few minutes.

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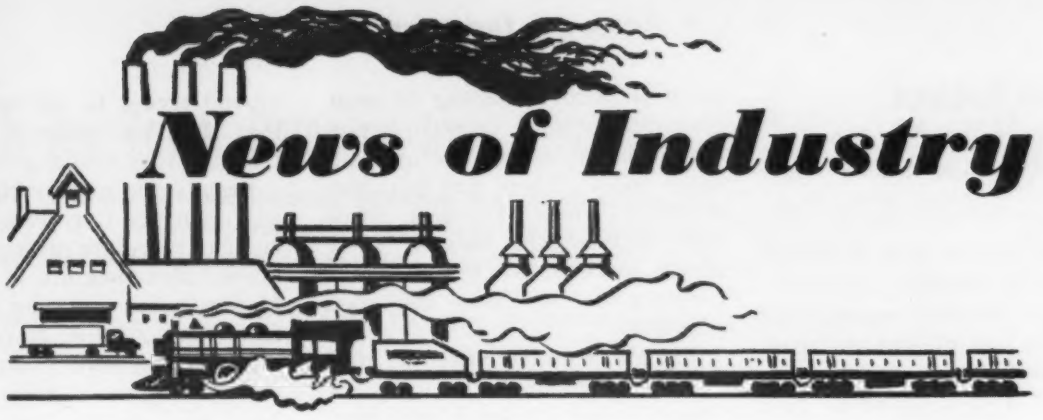

Another Iron Age First

New York—The first eyewitness account of U. S. Steel's fabulous ore discovery in Venezuela is a story of the energy, perseverance and vision of many men.

To get this story Tom Campbell, Editor of THE IRON AGE, flew 5500 miles, covered the ground by jeep and talked to the men on the spot.

Don't miss this human interest story of a strategic operation. It starts on page 75.

Fisher Body Plant Starts Production at Dravosburg

Pittsburgh—Limited operations got underway last week at the new Fisher Body Co. plant near Dravosburg, Pa., where tops for General Motors Corp. cars will be stamped out.

J. J. Cronin, GM vice president and general manager of the Fisher Body Div., indicated that by July 1 approximately 1000 workers will be employed at the plant. If demand for GM cars continues good, possibly 2000 will be employed at peak level.

One line of presses at the plant will be capable of stamping out 250 car tops per hour.

The Dravosburg operation is close to the Irvin Works of Carnegie-Illinois Steel Corp., and thus convenient to a source of supply of steel sheets.

Steel Exporters See Rough Sledding Ahead

European producers resume prewar practice of "dumping" . . . U. S. firms won't follow suit while domestic demand is high . . . Currency problems acute—*By BILL PACKARD.*

New York — The revival of strong domestic demand for steel during the past six months has diverted attention from significant changes which have been taking place in the export market.

Some of these changes appear to forecast a gloomy future for the iron and steel export business. But American firms are confident they can meet the double-barreled challenge of zooming European production and plummeting prices.

Those in the export business know what they are up against. They know all about the extensive modernization and expansion plans which are underway in most European countries. They have already felt the keen edge of competition from Europe's fast-reviving steel industries.

They have felt the impact of devaluation which tends to encourage exports while penalizing imports for the countries involved. They have run head-on into price cutting to the bone—and farther, in some cases. They have even encountered triple price standards: Home prices, free market export prices and "organized" (trade agreement) export prices.

American firms that export iron and steel products were not surprised by any of this. In fact they expected it and could have predicted it. Before the war they encountered "dumping" of iron and steel products on a large scale. They even indulged in a bit of it themselves. Now that the practice seems to be returning, they are not surprised. They may some day have to do it again to meet competition.

No Dumping—Yet

But there will be no dumping abroad by United States firms while domestic demand remains at its present high level. If steel demand had not recovered sharply in this country shortly after the middle of last year, we should probably have seen some dumping abroad by this time. Mill exporters know this only too well. No

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Republic Approves Pension Plan

Cleveland — A pension plan which will cover substantially all of the corporation's employees was approved by the stockholders of the Republic Steel Corp. at a special meeting held at Flemington, N. J.

The pensions payable to union members, in accordance with the labor agreement of Nov. 8, 1949, are included in this plan which goes into effect March 1, 1950.

Steel Export Problems

Continued from Page 115

one appreciates the healthy state of domestic demand more than they do.

Last year was a good year for iron and steel exports. Those in the business generally agree that the 5 million tons of iron and steel products sent abroad represent a satisfactory level of business.

Advantage on Flat-Rolled

They would be pleased if they could duplicate those sales this year. But most of them see rough sledding ahead. They know that their job will be infinitely harder than it was last year. They are hoping that domestic demand will hold up in this country, as well as in other nations. If it doesn't an international dogfight could develop in the world export market.

In their export sales efforts American firms are still stressing the same things they have stressed in the past—quality and service. They try to do their selling on that basis. They point out that there is no real saving in buying an item cheaper if there is greater waste involved, if it is harder to handle and slows down production, or if it causes a higher rate of rejects in fabricated parts. They also stress service to their customers—after the sale is made, as well as before.

Currency Problem Acute

Cold-rolled sheets and tinplate have long been profitable export items for American producers. They still are. This is true because American firms exploited the advantages of the continuous rolling mill (which amounted practically to a technological revolution) several years ago, while the Europeans are just beginning to do so.

The continuous mills being built in France and England today are a potential threat to American flat-rolled business abroad. However, they are still far from production. Their operation is not yet integrated. And quality and production costs cannot be known for certain until they are actually in production.

Currency difficulties are still an acute problem in selling to most countries. There is no question that dollar shortages are blocking many sales. There are countless instances where American firms have lost orders because their clients lacked dollars but had other currency to buy iron and steel products.

The absence of the pre-war steel cartel is undoubtedly an upsetting factor in the European steel market (but also a good one). In commenting on this, one exporter said, "They seem to be lost without a cartel. They are just floundering around trying to sell the tonnage that their nationalistic spirit determines they should produce."

Despite the price cutting which has occurred, European steel production costs are generally much higher than they are in the U. S. Modernization programs within the framework of the Marshall Plan are helping to lower them. Government subsidies in some countries have also helped them compete. This, of course, amounts to subsidy by taxpayers, and they might get tired of that.

Resume Your Reading on Page 115

Strike Reduced Steel Export Totals

Washington — Exports of iron and steel rose by 11 pct during 1949 while imports of these products declined by 4.6 pct. However, total export tonnage was considerably less than the 6.7 million tons shipped in 1947.

Export shipments amounted to 5,018,000 tons, according to preliminary Census Bureau figures. Imports totalled 455,000 tons.

The steel strike was sharply felt by exporters and caused a loss which can conservatively be estimated at more than 600,000 tons—based on the average of 475,000 tons monthly through September—and total actual shipments for the last quarter reported at 745,000 tons.

Imports also reflected the strike. Incoming shipments increased sharply including large tonnages returned from Canada when the pinch began to be felt.

The accompanying table shows iron and steel foreign trade totals for the past three years, by major categories:

Exports and Imports of Iron and Steel

(In thousands of net tons)

COMMODITY	Exports			Imports		
	1947	1948	1949(1)	1947	1948	1949(1)
Pig iron	11	6	81	34	222	103
Ferro-alloys	61	84	18	85	96	53
Ingots, blooms, billets, etc.	491	196	257	2	23	52
Bars and rods:						
Concrete reinforcement	248	120	108		1	10
Other	956	451	387	7	12	41
Plates	630	406	534	2	34	38
Sheets and strip:						
Black	796	563	714			
Galvanized	75	63	86			
Tinplate and terneplate	648	642	605	1	x	14
Structural materials	889	566	617	2	66	129
Railway track materials:						
Rails	413	246	203	9	5	1
Other	158	72	34	1	2	x
Tubular products:						
Cast iron pipe and fittings	47	37	58	x	2	x
Seamless (steel) pipe	324	286	337	7	5	5
Welded (steel) pipe	345	300	480			
Pipe fittings (other than cast)	24	25	24			x
Wire and wire products:						
Plain (black and galvanized)	185	127	131	x	x	4
Barbed	79	40	75			1
Other wire and manufactures	206	177	133	3	8	12
Castings	58	51	50	xx	xx	xx
Car wheels and axles	89	34	62	na	na	na
Forgings	37	28	24	1	1	1
Total	6,768	4,520	5,018	154	477	455

(1) Preliminary and subject to revision.
x Less than 500 tons.
xx Included in imports of forgings.
na Not available.
Source: Prepared from data supplied by U. S. Bureau of the Census.

Railroads Ask Lower Rates on Iron, Steel

Move is aimed at recapturing revenue lost to trucking industry . . . Proposed reduction has been under study for several months . . . Truckers squeezed—*By JOHN DELANEY*

Pittsburgh — The railroads are getting set to make their first real move to recapture some of the iron and steel traffic lost to highway carriers.

Truckers have been taking business away from the railroads at an alarming rate in the last several years due to truck rates that average about 25 pct under those of the rails on iron and steel products. On an average, steel shipments by truck increased a minimum of 26 pct in 1948 and 1949.

Reductions Average 30 Pct

So the announcement by John J. Fitzpatrick, chairman of the Traffic Executive Assn., Eastern Railroads, that the roads are proposing "substantial reductions" in iron and steel rates to meet the competition of the highway carriers was not wholly unexpected.

Mr. Fitzpatrick said the proposed rates will be based on graduated scales and will be subject to a new and heavier minimum carload weight of 80,000 lb per car.

It was understood the reductions will average 30 pct on such shipments.

Lower Rates Have Been Allowed

The railroads have been allowing a lower rate on 80,000 lb minimum shipments in the south and west, but this is the first indication that it will be extended to the eastern territory embracing the area east of the Mississippi and north of the Ohio and Potomac Rivers — a territory where iron and steel production and consumption is concentrated. The 80,000 lb minimum has been in effect from Birmingham to Memphis and from Geneva, Utah, to the West Coast, for example.

Result of Long Study

The proposed rate reduction is the outcome of several months of study by traffic executives of the eastern railroads, and it is likely that the recommendations of steel producers and consumers have been a major influence in the decision.

As a matter of fact, the steel companies have not been very happy about the steady increase in truck shipments. Most mills were designed to handle shipments by rail, and the trucks have been something of a nuisance. Under F.O.B. mill pricing, however, the producers have been obliged to ship by truck when the customer, who is paying the

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December Finished Steel Shipments

As Reported to the American Iron & Steel Institute

Steel Products	Number companies reporting	Line	December — Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	December — Per cent of Total Shipments	December — Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)	Total - 1949 — * Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Total - 1949 — Per cent of Total Shipments	Total - 1949 — * Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)
Ingots, blooms, slabs, billets, tube rounds, sheet and tin bars, etc.	47	1	219,859	4.1	168,207	2,261,289	3.9	1,968,301
Skelp	6	2	18,364	0.3	50,265	118,533	0.2	447,312
Wire rods	21	3	61,606	1.1	26,726	570,397	1.0	257,299
Structural shapes (heavy)	11	4	340,575	6.3	93	3,669,503	6.3	3,367
Steel piling	4	5	19,182	0.4	-	301,824	0.5	-
Plates	68	6	519,259	9.6	38,509	5,759,063	9.9	409,589
Rails—Standard (over 60 lbs.)	4	7	134,134	2.5	1	1,772,734	3.0	594
Rails—All other	5	8	7,209	0.1	1	117,154	0.2	462
Joint bars	7	9	7,724	0.1	1,250	118,559	0.2	12,521
Tie plates	6	10	21,526	0.4	-	373,337	0.6	-
Track spikes	8	11	6,789	0.1	-	95,345	0.2	35
Wheels (rolled or forged)	5	12	22,166	0.4	-	285,733	0.5	-
Axles	5	13	5,202	0.1	-	159,628	0.3	-
Hot rolled bars (including light shapes)	40	14	605,821	11.2	66,711	6,416,102	11.0	611,514
Hot rolled bars—Reinforcing	24	15	138,052	2.6	-	1,572,588	2.7	221
Cold finished bars	33	16	98,841	1.8	330	1,213,052	2.1	6,220
Tool steel bars	17	17	3,372	0.1	61	57,395	0.1	605
Pipe—Standard	17	18	205,550	3.8	4,257	2,090,445	3.6	48,250
Pipe—Line	14	19	241,895	4.5	2,679	2,534,423	4.4	18,252
Pipe—Oil country goods	14	20	134,089	2.5	9,494	1,365,982	2.3	85,484
Tubes—Boiler	3	21	6,886	0.1	342	107,970	0.2	8,027
Tubes—Mechanical and pressure	21	22	47,072	0.9	474	617,663	1.1	14,114
Miscellaneous pipe (including conduit)	12	23	17,159	0.3	46	218,737	0.4	1,180
Wire—Drawn	38	24	241,417	4.5	9,181	2,138,878	3.7	112,872
Wire—Nails and staples	17	25	70,490	1.3	539	731,356	1.3	7,412
Wire—Barbed and twisted	15	26	14,831	0.3	-	215,047	0.4	32
Wire—Woven wire fence	15	27	27,831	0.5	-	358,162	0.6	1,504
Wire—Bale ties	12	28	2,754	-	-	42,828	0.1	-
Black plate	10	29	36,072	0.7	11	452,041	0.8	112
Tin and terne plate—Hot dipped	10	30	144,550	2.7	-	1,699,355	2.9	-
Tin plate—Electrolytic	10	31	181,028	3.3	-	1,993,468	3.4	-
Sheets—Hot rolled	28	32	569,298	10.5	67,358	6,198,610	10.7	593,398
Sheets—Cold rolled	16	33	680,909	12.6	676	6,886,946	11.8	9,161
Sheets—Galvanized	15	34	188,223	3.5	12	1,755,067	3.0	222
Sheets—Long terne	2	35	14,451	0.3	-	151,118	0.3	-
Sheets—Enameling	9	36	17,610	0.3	-	162,815	0.3	-
Sheets—Electrical	11	37	35,537	0.7	-	379,180	0.6	-
Strip—Hot rolled	24	38	164,377	3.0	25,646	1,674,818	2.9	247,749
Strip—Cold rolled	35	39	136,984	2.5	2,955	1,465,297	2.5	25,071
All other	5	40	269	-	-	7,570	-	-
Total steel products	138	41	5,410,902	100.0	475,824	58,104,010	100.0	4,888,845

During 1948 the companies included above represented 99.5% of the total output of finished rolled steel products as reported to the American Iron and Steel Institute.

* Revised.

Weirton Retires "Iron Horses"

Weirton, W. Va. — The "iron horse" is little more than a memory at the Weirton Steel Co., which has completed dieselization of its railroad operations.

Weirton now has ten large diesel locomotives in the 100 to 115-ton class; five 50-ton locomotives, and two 25-ton engines.

The old steam locomotives are being scrapped.

Syntron Moves Sales Office

New York—Syntron Co., Homer City, Pa., manufacturers of vibratory material handling equipment, portable power tool equipment and allied items, have moved their New York sales and engineering office from Long Island City to 1860 Broadway, New York 23.

Joy Mfg. Co. Declares Dividend

Pittsburgh — Completing a 22-year record of consecutive dividend payments on common stock, directors of Joy Mfg. Co. declared a quarterly dividend of 50 cents per share, payable Mar. 10 to holders of record Feb. 27.

INDUSTRIAL SHORTS

BEST WISHES ISIS! — The twenty-first anniversary of the INSTITUTE OF SCRAP IRON & STEEL will be celebrated at a banquet on Mar. 12 at the Waldorf-Astoria Hotel, New York, in honor of the founders of the institute.

ROLLING SHEETS — A new division for the rolling of magnesium sheet will be established by ALUMINUM CO. OF AMERICA at its New Kensington, Pa., works in the near future. It was formed because of the increased demand in airplane construction and other phases of the national security program.

INLAND'S MINE — The Price Mine, a new development of the INLAND STEEL CO., Wheelwright, Ky., is being completed for operation in early 1950. The mine, using General Electric's electrical equipment extensively, will have a capacity of 750 tons per hour.

NEW HOME — Franklin Park, Ill., is the location of the new plant of the FIAT METAL MFG. CO. The firm manufactures shower cabinets, receptors, doors and metal partitions.

EASTERN FACILITIES — Whirl-A-Way Motors, Inc., Tipp City, Ohio, has been contracted by A. O. SMITH CORP., Milwaukee, to manufacture Smithway fractional horsepower motors to specification. These facilities will serve the eastern region of the United States. D. L. Mills, president of Whirl-A-Way, has been appointed eastern regional sales manager of the Motor Div. with headquarters in Dayton.

SALES OFFICE—The Wolverine Tube Div. of CALUMET & HECLA CONSOLIDATED COPPER CO., Detroit, has established a new sales office at 81 Madison Bldg., Memphis, Tenn. M. J. Cook, Wolverine representative will headquarter in the new office.

OPEN HOUSE — "Dixisteel on Dixie Farms" will be the overall theme of the ATLANTIC STEEL CO.'S open house May 5 and 6 in Atlanta. The company supplies a wide range of prime materials and fabricated parts to manufacturers of agricultural machinery and equipment.

TOOL PROBLEMS—The causes, costs and cure for the "stick-slip" phenomenon frequently encountered in certain machine tools are discussed in a new booklet prepared by SUN OIL CO., Philadelphia. It also outlines the cooperation of Sun research engineers and a prominent machine tool builder in the development of Sunoco Way Lubricant.

VALVE CLINIC — The second stainless steel valve clinic sponsored by the COOPER ALLOY FOUNDRY CO., Hillside, N. J., will take place Apr. 26 in the form of a dinner-meeting at the Statler Hotel, Buffalo. Tickets are free to all valve buyers and engineers in the Buffalo area.

DIRECT SALES—The CURTIS UNIVERSAL JOINT CO., Springfield, Mass., has always been represented exclusively in the United States by one jobber, Boston Gear Works, No. Quincy, Mass. A change in sales policy now enables any customer to order direct from Curtis thereby saving from 5 to 20 pct.

BUYS WIRE COMPANY—The capital stock of the Reynolds Wire Co., Dixon, Ill., manufacturers of fine wire, wire cloth and mesh, has been acquired by the NATIONAL STANDARD CO. of Niles, Mich.

NEW MARKET—A new southwest sales district has been established by the Chemical Div. of KAISER ALUMINUM & CHEMICAL SALES, INC., Oakland Calif. R. L. Petersen will head the new district with offices in the City National Bank Bldg., at Houston.

Railroads Ask Lower Rates

Continued from Page 117

freight, so specifies. The proposed rate changes will probably swing a lot of this business back to the railroads.

Before new tariffs are filed with the Interstate Commerce Commission, steel consumers, producers and other interested groups will be given an opportunity to express their views at a special meeting at the William Penn Hotel, here, Mar. 9.

Truckers Being Squeezed

No estimate of how much revenue the railroads will recapture by this move will be available until after the Pittsburgh meeting when the rate changes will be finally determined, but there is little doubt that it will be substantial.

That is, unless the truckers, who have come to value the volume of iron and steel traffic highly, take some action to counter this move by the railroads. The truckers are proposing to increase rates on iron and steel shipments Mar. 15 an average of 15 pct, which would still leave their charges about 10 pct below the rails. This may prompt the truckers to reconsider.

The railroads' proposal comes at a time when the truckers are being squeezed from three directions: Rising wage and material costs; voluntary arrangements against overloading of trucks at steel plants, and pressure from the railroads and other groups to force the truckers to pay higher taxes for repair of streets and highways the big trucks are supposed to be breaking down.

A reduction of 30 pct would make the railroads more than competitive. For example, the Pittsburgh-to-Detroit rail rate per 100 lb is now 51¢. On a haul of 80,000 lb or more, the new rate would be about 35¢. Common carrier rates for trucks are now 40¢, and the truckers propose to increase this to 46¢. Contract rates for trucks are lower, of course.

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1948 Level Maintained In Output of Goods and Services

Washington — Continued high production in 1949 had the effect of keeping the gross national product—output of goods and services—at about the same levels as in 1948.

Dollar-wise, the gross national product dropped from $262 billion to $257 billion. However, after allowing for lower prices of goods, the actual physical volume showed little decrease.

Part of the stability was caused by increased government expenditures for goods and services. Government purchases which were up by $6 billion included the $18 billion spent by state and local governments.

As analyzed by the Dept. of Commerce, purchasing of $24 billion worth of durable goods was up largely because of increased motor vehicle purchases. However, $99 billion in purchases of nondurables was a $3 billion drop from 1948. Inventories were reduced by $2.5 billion during the year in contrast to the increase of $6.5 billion in 1948. Net foreign investment declined from about $2 billion in 1948 to almost nothing last year.

Buick Sales Hold High Level

Flint, Mich.—Buick sales hit another all-time peak of 13,865 during the first ten days of February. This is an increase of 34 pct over the same period a year ago.

Buick sales during January were the largest of any January in Buick's history and the first ten days of February are larger than any 10-day period in January, according to O. L. Waller, general sales manager.

J. & L. Expands Southside Plant

Pittsburgh — Jones & Laughlin Steel Corp. will start work on its $40 million expansion program at the Southside plant soon, perhaps this spring. With assurance that a few properties still not acquired will be obtained, the company has asked for bids on 13,000 tons of structural steel for the biggest item in the project—a six furnace open hearth shop.

Although originally expected to have a capacity of 800,000 tons annually, it was understood the furnaces will produce 1,000,000 tons a year due to revised plans. This will mean a net ingot capacity increase of 600,000 tons since some smaller furnaces will be retired.

Navy Orders Jet Engines

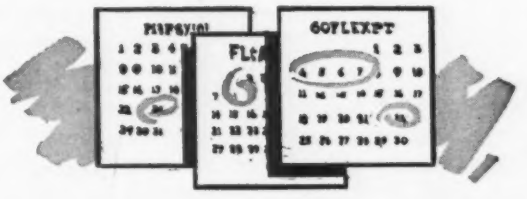
Washington—A contract for jet engines amounting to $9.8 million has been awarded the Pratt & Whitney Aircraft Div., United Aircraft Corp. by the Navy Dept. Worthington Pump & Machinery Corp. was given a $54,000 contract to supply 379 line items and diesel motor parts.

Urges Repeal of Excise Tax To Avoid Future Unemployment

Detroit—Repeal of the Federal excise tax as a means of avoiding future unemployment was urged before the House Ways and Means Committee by George Romney, vice-president of Nash-Kelvinator Corp. and a member of the AMA Taxation Committee.

The automobile employment curve is highly sensitive to the sales curve, Mr. Romney said, and Congress should act now and not wait until business is affected.

Mr. Romney said the Federal excise levy adds about $95 to the selling price of an average new car and about $76 to the price of trucks. In addition, he said, the Federal



Dates to Remember

Mar.	14-16	**Society of Automotive Engineers**, passenger car, body and production meeting, Detroit.
Mar.	16-17	**Pressed Metal Institute**, technical symposium, Cleveland.
Mar.	20-25	**Concrete Reinforcing Steel Institute**, annual meeting, Houston.
Mar.	21-22	**Steel Founders' Society of America**, annual meeting, Chicago.
Apr.	3-4	**Assn. of Iron & Steel Engineers**, spring conference, Birmingham.
Apr.	4	**Society for Applied Spectroscopy**, meeting, New York.
Apr.	4-7	**National Assn. of Corrosion Engineers**, annual conference, St. Louis.
Apr.	4-8	**Chicago Technical Societies Council**, national production exposition, Chicago.
Apr.	5-7	**American Institute of Electrical Engineers**, conference on electric welding, Detroit.
Apr.	5-7	**Midwest Power Conference**, Chicago.
Apr.	10-12	**American Institute of Mining & Metallurgical Engineers**, annual openhearth, blast furnace, coke oven and raw materials conference, Cincinnati.
Apr.	10-12	**American Society of Lubrication Engineers**, annual convention, Detroit.
Apr.	10-14	**American Society of Tool Engineers**, industrial cost-cutting exposition, Philadelphia.
Apr.	11-12	**American Zinc Institute**, annual meeting, St. Louis.
Apr.	12-14	**American Society of Mechanical Engineers**, spring meeting, Washington.
Apr.	12-14	**National Petroleum Assn.**, semiannual meeting, Cleveland.
Apr.	24	**Packaging Machinery Manufacturers Institute**, semiannual meeting, Chicago.
Apr.	25-26	**Metal Powder Assn.**, annual metal powder show, Detroit.
Apr.	27-28	**American Steel Warehouse Assn.**, annual meeting, Houston.

Government assesses motorists for gasoline, oil, for tires and tubes, and the replacement parts and accessories they need to keep their car or truck operating.

Air Force Awards Contracts

Washington—The Air Force has awarded contracts totalling $1.53 million to the Eclipse-Pioneer Bendix Aviation Corp. The orders consist of F-1 and F-2 autopilots, and A-3 vertical gyros.

Other contracts include awards to Goodyear Tire and Rubber Co. for brakes and wheels, $323,925; Minneapolis-Honeywell Regulator Co. for E-6 autopilots, $488,571; the Loewy Construction Co., forging presses and spare parts.

Puerto Rico To Get First Rolling Mill

Bar mill and other facilities being dismantled prior to shipment there . . . Development in line with island's campaign to attract American industry.

Pittsburgh—Puerto Rico's first steel rolling mill will be set up in San Juan, the capital city, perhaps within the next year.

The American Swedo Iron Corp. plant at Danville, Pa., including a bar mill and other facilities, is now being dismantled for shipment to the island.

The development is in line with Puerto Rico's campaign to attract American industry, and may represent the start of a modest steel industry there. The island has ample electric power, and it is probable that electric furnaces could be operated economically. With completion of the Caonillas Dam in 1948, the island boasted 18 hydro-electric installations with an annual capacity of 400 million kw.

Will Buy Service Here

At the start, the plant will roll bars from billets purchased in this country. The bar mill is a Belgian type 8-in. 3-high 5-stand installation, with a 10-in. 3-high 1-stand

January Iron & Steel Production by Districts

As Reported to American Iron & Steel Institute

Blast Furnace Capacity and Production—Net Tons

	Number of Companies	Annual Blast Furnace Capacity	PRODUCTION							
			PIG IRON		FERRO-MANGANESE AND SPIEGEL		TOTAL			
									Pct of Capacity	
			Current Month	Year to Date	Current Month	Year to Date	Current Month	Year to Date	Current Month	Year to Date
Distribution by Districts:										
Eastern	12	13,353,580	961,244		28,735		989,979		87.3	
Pittsburgh-Youngstown	16	26,735,520	2,027,369		24,889		2,052,258		90.3	
Cleveland-Detroit	6	7,044,600	574,727				574,727		96.0	
Chicago	7	15,897,190	1,052,699				1,052,699		77.9	
Southern	8	5,141,250	427,695		7,208		434,903		99.6	
Western	4	3,325,400	189,030				189,030		66.9	
Total	36	71,497,540	5,232,764		60,832		5,293,596		87.1	

Steel Capacity and Production—Net Tons

	Number of Companies	Annual Steel Capacity	PRODUCTION							
			TOTAL STEEL				Alloy Steel* (Incl. under total steel)		Carbon Ingots-Hot Topped (Incl. under total steel)	
					Pct of Capacity					
			Current Month	Year to Date	Current Month	Year to Date	Current Month	Year to Date	Current Month	Year to Date
Distribution by Districts:										
Eastern	24	19,875,460	1,472,249		87.2		92,232		276,160	
Pittsburgh-Youngstown	34	39,145,920	3,116,854		93.7		400,915		347,168	
Cleveland-Detroit	8	9,333,460	784,662		98.9		40,102		96,837	
Chicago	15	20,777,520	1,722,888		97.6		136,137		249,158	
Southern	8	4,560,820	402,736		103.9		3,976		3,189	
Western	11	5,699,620	430,983		89.0		8,570		9,443	
Total	79	99,392,800	7,930,372		93.9		681,932		981,955	

* For the purpose of this report, alloy steel includes stainless and any other steel containing one or more of the following elements in the designated amounts: Manganese in excess of 1.65%, and Silicon in excess of 0.60%, and Copper in excess of 0.60%. It also includes steel containing the following elements in any amount specified or known to have been added to obtain a desired alloying effect: Aluminum, Chromium, Cobalt, Columbium, Molybdenum, Nickel, Titanium, Tungsten, Vanadium, Zirconium, and other alloying elements.

roughing mill. Capacity is 12,000 tons per year.

Other equipment to be shipped includes an automatic oil-fired reheating furnace, large billet shears and machine shop and roll turning facilities.

American Swedo Iron Corp., headed by Harold T. Henry, president and general manager, was incorporated in December, 1940. In November, 1946, it was converted from a puddle forge to a steel rerolling mill, and has been producing bars in small sizes in rounds, flats, squares and special shapes, and rerolling billets to a maximum size of 3-in. square.

Puerto Rico May Make Tax Benefits to Business Permanent

New York—Puerto Rico's campaign to attract American industry received another boost last week in the form of a tax message from Gov. Luis Monon Marin to the legislature.

He recommended that Puerto Rico's widely publicized tax exemption law, which grants a tax holiday to new industries until 1959, be amended, substituting a system of permanent low taxation benefits to be shared by all.

The Governor pointed out that such a system would be more effective in its appeal to investors than the present temporary exemption.

The Puerto Rican policy has been to lure American investors by the promise of exemption from local taxes, as well as Federal income taxes, from which the island was exempted when the Federal law was passed 30 years alo.

Sales Discussions Highlight Meetings of U. S. Steel Firms

Chicago — Though many steel products are temporarily in short supply at the moment, the seller's market of wartime and postwar years is gone. This was the point emphasized at meetings of two U. S. Steel Corp. subsidiaries here this week.

The annual meeting of district managers, department heads, and assistants of the U. S. Steel Supply Co., held Feb. 20 and 21, was the first annual meeting in several years to be devoted principally to discussion of methods of increasing sales. A sales meeting of the American Steel & Wire Co., including company executives and Chicago area salesmen, was the first such gathering held by the company's sales department since 1938. The meeting, stressing sales techniques, was held Feb. 21 and 22. Similar meetings will be held in the company's other two sales areas—New York and Cleveland, in the near future.

Malleable Iron Business Picking Up

Orders now reported increasing, after dropping during second half of last year . . . Prices are firm but competition is reported rugged—*By BILL LLOYD*

Cleveland—Outlines of an 800,000-ton year, about a 12 pct increase over 1949 and one of the best years for the malleable iron industry since Seth Boyden first made malleable in 1826, were taking shape for malleable iron foundrymen this week.

Goal of the industry is 1,000,000 tons, which was nearly reached in 1948 with shipments of 933,265 tons. But it is doubtful that 1950 will see this record reached or surpassed, although spokesmen for major segments of the industry feel that aggressive selling can turn the trick.

Shipments of malleable iron castings in 1949 were 713,107 short tons, a 24 pct drop from 1948.

Clouding the outlook are a pair of substantial imponderables, the coal crisis and a strike at Chrysler Corp., Detroit.

Orders Reported Increasing

On the plus side of the outlook is a definite upturn in orders and shipments which got under way in the early part of Dec., 1949. December production was 11 pct higher than November and it is estimated that January production was up an additional 10 to 15 pct. Indications are that the first quarter will be as good as the first quarter of 1949.

Order backlogs in major segments of the industry are increasing and according to reports were substantially higher Feb. 1 than they were on Dec. 1.

Prices are firm, but the market, particularly in automotive castings, is very competitive.

Business Good in Midwest

Majority of malleable foundries were operating at 40 to 50 pct of capacity in Nov., 1949, with a few as high as 60 pct. For the month of January, most of the companies in the Middlewest are operating from 70 to 100 pct, although a few are still in the range of 40 to 60 pct. Practically all of the large producers are operating at peak or near peak capacity now.

Production of malleable castings for passenger cars, trucks and trailers in 1949 held up well com-

"Egg sandwiches every day for over a year now."

pared with 1948, dropping only about 9 pct. At the present anticipated high rate of production of cars and trucks in 1950, there is no reason to suppose that this phase of the malleable business should not be good in 1950. Malleable castings for cars and trucks take about 53 pct of the industry's total annual output.

Most serious decline in a major segment of the malleable industry in 1949 occurred in the railroad field, where the decrease was 51 pct. Railroad producers today report a considerable improvement in the outlook.

Tonnage production per month in 1949 declined steadily throughout the year, reaching bottom in November. Actually July was slightly lower, but allowing for seasonal factors and plant shutdowns, November was "the bottim."

Pushing Pearlitic

A hopeful sign has been the increased production and use of pearlitic malleable in recent years. Many companies have done an aggressive selling job in promoting high strength pearlitic for special purposes. Production of this type of malleable has increased nearly 50 pct since 1945 and the prospect for 1950 is that production may be still higher than in any preceding year.

For an industry which suffered immediately after the war by an inability to produce castings for delivery as promptly as required by some customers, due to a scarcity of raw materials, the malleable iron industry is out to recapture business which was lost in the scramble. Most of it has already been regained, and the malleable industry is anxious to tax its million-ton capacity.

Urge Greater Machine Tool Sales Effort

Government is the greatest competitor of the machine tool industry . . . More effective sales methods must be used to combat competition of used machinery dealer.

Cleveland—"What we have today is a 1935 machine tool industry to fight a possible 1950 war." This statement sums up in brief the present condition of the machine tool industry, according to Tell Berna, general manager of the National Machine Tool Builders' Assn., in a recent conference of advertising executives of member companies.

Recalling the industry's experience in World War II, he argued that the machine tool industry should not be cluttered up with subcontract work in wartime, but should be allowed to devote its entire efforts to the production of machine tools. War material requires very close tolerances and the finest machine tools, he added.

Mr. Berna also pointed out that whereas at one time the government was the industry's largest customer today it is its largest competitor. Each week government surplus sales, auctions, and plant, tool and die shop liquidations add more machine tools to the used machinery market.

The machine tool industry must bring home to its customers the facts concerning lowered production due to obsolete machines. "A man buys a machine tool to make a profit," he asserted. New machines bring greater production and greater profits.

Greater Coordination Urged

To bring home these facts, J. E. Loudon, advertising manager, Cone Automatic Machine Co., keynoted the conference by urging a coordinated effort toward a common goal and maximum return on the machine tool advertising dollar.

A resolution was passed by the conference members requesting the NMTBA directors to appoint a committee on advertising. The objective of the committee would be to explore the possibility of forming an advertising council which would coordinate sales promotion and advertising in the machine tool industry. Its major purpose would be to bring machine tool advertising more nearly in

KING SIZE WELDMENT: This 55 ton structure being readied for shipment at Allis-Chalmers is one of the six sections to be assembled at the Army Engineers' Bull Shoals Development as the spiral casing for a 62,000 hp hydraulic turbine. It is fabricated from rolled sections of 1-in. steel plate and a cast steel speed ring section.

line with the work of machine tool salesmen. It would include development and improvement of reader interest in machine tool company advertising and the establishment of closer coordination with trade papers to bring out a more effective return from trade paper space.

Greater results must be obtained from machine tool advertising to effectively meet the competition of used machinery dealers. Donald M. Pattison, vice president in charge of sales, Warner & Swasey Co., revealed that used machinery dealers sold 50 pct more turret lathes in 1949 than turret lathe builders. He emphasized that this condition may continue for another five years. "We will have to dig for business," he added.

Users Are Buying Output

To speed the movement of machine tools down the line from one shop to another, L. W. Scott Alter, president and general manager, American Tool Works, and chairman of the NMTBA public relations committee, called for a siphoning off process in the machine tool market, whereby machine tool users would call their plant dealer for an appraisal of "sleepers" or little used machines and get them out of the plant and on the market.

He called for setting up of equipment ledgers, and shop appraisal, so machine tool users will know the real market value of their equipment as well as what they're getting out of it. There are a lot of sleepers in every shop, Mr. Alter declared. Survey and re-survey, he advised. Users are buying output not machines.

Mr. Alter pointed out that machine tools can still be sold on a prestige basis and suggested that salesmen not overlook it in their sales presentations. Users are more replacement conscious today than they ever were, he continued. "We must tap the replacement market if we are to survive. We can no longer depend on the expansion of our customers."

Reduced Steel Output Threatens Fabricators

Troubles resulting from coal strike pile up quickly . . . Stocks of small metal stampers near exhaustion . . . Major producer allocates bars . . . *By GEORGE ELWERS.*

Chicago — Up until last week, the Chicago area had succeccfully avoided any serious difficulties due to the coal strike. But trouble has now started to come, and it is coming fast. Steel output was cut for the first time, industrial plants announced their steam coal reserves had reached a critical point, and curtailment of electric power is expected this week.

Steel mills managed to keep their rate around 100 pct until last week, when Inland banked its fifth blast furnace and had to cut its steel output by 30 pct. Inland may cut another blast furnace and further curtail its finishing operations. Other mills will probably have to curtail operations and when they cut they will have to cut fast.

Trouble is already here for users of sheet, strip and light plates. These products have been on allocation right along, and few users have had a chance to build up or maintain a good inventory. The mills have no appreciable inventories, and warehouses are virtually cleaned out. One big warehouse here has never been so bare of flat rolled steel as it is now, even during the war. Any cuts in production of flat rolled steel will thus be reflected immediately in reduced output of manufacturing plants. In fact, production of enamelware and enameled steel household appliances have already been affected by Inland's curtailment of normalizing furnace operation.

Chrysler Stores Allotment

Steel stocks of the many small or medium metal stampers in this area are at best very unbalanced, with stocks of many, if not most, gages near exhaustion. Flat rolled users have not benefited from the Chrysler strike, since Chrysler is

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STEELSORTER: Steelsorter, developed by Jones & Laughlin Steel Corp. researchers and produced by the Fisher Scientific Co., Pittsburgh. The machine sorts steel products of similar appearance but of differing chemical, physical or metallurgical properties by detecting magnetic differences in the metals.

Viewing the News from

The ECONOMIC SIDE

By JOSEPH STAGG LAWRENCE

"Consuming The Seed Corn"

AT the time of writing, the House Ways and Means Committee is weighing the reduction of depletion allowances in the extractive industries. Under prevailing law, the oil industry is permitted to take a tax credit amounting to 27½ pct of its gross production. This credit may not exceed half of reported net earnings.

The President has called the attention of Congress to this allowance, claiming that it is excessive generally and is subject to particular abuse. He asked the legislature to look at depletion as a possible source of added revenue, as a spot in the income structure where the Treasury might find income with which to offset a recommended 50 pct cut in excise taxes.

It is clear that the Administration is beginning to fear the strong tide of protest against deficits incurred in years of peak prosperity. The argument that ample outlay, even at the cost of red ink, is more important than economy has not proven entirely persuasive. Insofar as the search for added revenue is a belated response to the growing public demand for tidier financial housekeeping, the request of the President is salutary.

The exchange of depletion credits for excise taxes as a source of revenue is not sound either fiscally or economically. To a greater degree than any other civilized government, Uncle Sam derives his income from the most volatile sources. In no other country is there so complete a dependence upon personal income and corporate profit taxes as in the United States. These are precisely the revenue areas which are most sensitive to a decline in the economy. Nowhere else is there so little reliance upon the most stable of all forms of taxation, namely, the imposts upon consumption.

Economically, a material reduction in depletion allowances invites natural resource poverty and military weakness. The credit for depletion rests on the just recognition that wealth in the ground is an asset of limited life; that consumption is final and cannot be compensated by depreciation. Depletion further recognizes the exceptionally hazardous character of the exploration and discovery upon which the country must depend to replace the oil, the coal and the minerals which are daily brought to the surface.

The oil man who drills five dry holes and nevertheless persists with the sixth and successful attempt would hardly do so if the tax law failed to allow for the great and special risks entailed. There is no point in drilling dry holes that cost $100,000 if Uncle Sam insists on a full slice for himself when a gusher is found but refuses the driller the extra reward which justifies the persistence.

A great war has just emphasized the importance of oil in national defense. If depletion is cut, oil will continue to come from pools that have already been discovered. The failure of new discoveries will not be immediately noticeable in current production. However, when the great squeeze is on and the nation stands in mortal peril the failure to encourage wildcatting and the search for new oil will come home with tragic and possibly fatal force.

The proposal to cut depletion allowance is shortsighted. It may mean an immediate increase in taxes. The price will be paid in diminished known reserves, greater scarcity, higher costs, and higher prices. Ultimately the Treasury itself will suffer a loss in revenue through lower volume. Again, our government proposes that we eat our seed corn.

Final Decision Coming Up In FTC Steel Price Investigation

Industry, government attorneys conclude oral arguments for case.

Washington—The Federal Trade Commission last week moved a step nearer a decision on issuance of a consent order involving the steel industry's pricing system. Attorneys for both the industry and the FTC concluded oral arguments.

The order was drawn up by Lynn Paulson, FTC counsel in charge of the case, with the assistance of industry attorneys (THE IRON AGE, Dec. 8, 1949). It has been opposed by both the litigation and compliance divisions of the FTC.

Peaceful Settlement

Two main questions were involved in the objections within the FTC. One is whether the order goes far enough in banning multiple basing point pricing while permitting individual freight absorption. The other is whether the order would be valid and enforceable.

This dissension within the FTC has left the commissioners on a spot. Numerous continuances have been granted for the very purpose of allowing the case to be settled amicably—that is, to agree upon new pricing standards without long, drawn-out litigation while the FTC tried to prove its case.

Richard P. Whitely, litigation director, has argued that it is beyond the authority of the FTC to issue the order agreed to by Mr. Paulson and the industry unless there were actual findings of fact.

Case Would Continue

On the other hand, Joseph S. Wright, compliance chief, does not question the authority of the FTC to issue the order, but, he says, he agrees that compliance could not be assured without such findings.

In effect, this would mean a continuation on the case, which charges the industry with con-

spiracy, to a conclusion. However, Whitely said, the same effect could be achieved if the industry would enter a "no contest" plea to the evidence gathered by the FTC to support its case.

Arguing for acceptance of the order, Roger Blough, attorney for U. S. Steel, said that the industry had acted in good faith in helping to draw up the order and that it would comply in both letter and spirit. He defined a bona fide "mill price" as one at which the seller hopes to get business and on which some business is based.

Steel Casting Production Swings Upward

Increased production forecast for the next few months . . . Renewal of durable goods buying and revival of advance orders form basis for optimistic viewpoint.

New York—Steel casting production has increased materially in recent weeks and there are prospects of further increased manufacturing operations over the next few months. This was reported here recently at a meeting of management, production and sales executives of leading eastern steel foundries. The optimistic outlook was based on renewal of durable goods buying and revival of advance orders for railway equipment.

Convening as active members of the combined Management and Product Development Groups of Div. #1, Steel Founders' Society of America, the regional conference group primarily discussed the society's intense research and developmental activities directed toward lowering costs and improving manufacturing processes and products.

Decided Upturn From Fall Level

Society members include principal steel casting companies in all New England States, New Jersey, Delaware, Maryland, eastern and southern sections of New York, Pennsylvania and Virginia, and the province of Quebec.

Definite evidences that operations in the nation's steel foundries are improving were shown by F. Kermit Donaldson, SFSA vice-president, who stated that the outlook for the steel casting industry is decidedly improved over last autumn. "Although operations on an industry wide scale are not back to what we would call normal," he reported, "there has been a decided upturn from the fall level when numerous manufacturing plants operated only three or four days a week.

"Renewed buying of durable goods is brightening the picture," he added, "and increased ordering is expected from renewed purchasing in the railway equipment field and others normally responsible for heavy tonnage."

Research Results in Savings

Importance of research to the industry, as a means of reducing costs of production and improving the quality of castings, and effectively providing foundrymen with valuable data to meet present day competition, also was emphasized.

More than $200,000 has been spent on the society's research program to date. As a result of the research program conservative estimates indicate potential savings to the industry of between $2 million and $8 million, depending on the extent to which the research findings are actually applied to production and sales problems by individual foundries.

Other speakers at the meeting included G. Rhoads Casey, president of Treadwell Engineering Co., Easton, Pa., Arthur S. Breithaupt, vice-president of Dodge Steel Co., Philadelphia, and William J. Phillips, director of the product development department of the society.

Marshall Plan Approves $2 Million Portuguese Purchase

Washington — First Marshall Plan purchases for Portugal totalling $2 million have been approved. They involve machinery and equipment, crude oil and petroleum products, aluminum and copper, iron and steel mill materials, and more vehicles, engines and parts.

Most of the commodities, totalling $1.6 million, will come from the United States and the balance of $350,000, from Canada. To date, the ECA has allocated $10,000,000 to Portugal from 1949-50 Marshall Plan funds.

Portuguese purchase approvals announced recently from the United States were: $536,000 for construction, mining and conveying equipment; $480,000 for crude oil and petroleum products; $185,000 for industrial machinery, $180,000 for motor vehicles, engines and parts; $113,000 for generators and motors; $40,000 for engines and turbines; $35,000 for electrical apparatus; $10,000 for iron and steel mill materials and products and ferro alloys; and $1,000 for copper and copper products; and from Canada—$73,000 for industrial machinery; $182,000 for aluminum and aluminum base alloys and aluminum products; and $95,000 for electrical apparatus.

Italian Co. Buys U. S. Motors

Pittsburgh—A $400,000 contract for motors and auxiliary equipment for a new rolling mill destined for Italy has been awarded to the Westinghouse Electric Corp. by the E. W. Bliss Co. of Salem, Ohio.

Westinghouse will supply the main driving motors and auxiliary electrical equipment for the single-stand strip mill now being built by Bliss for Cantieri Mettallurgici Italiani of Castellammare, Di Stabia, Italy. The mill is designed to serve either as a cold reducing mill or as non-reversing temper pass mill.

Construction Steel Awards

Fabricated steel inquiries this week included the following:

6000 Tons, Harrisburg, Pa., State Highway & Bridge Authority, Foster St. bridge, due Mar. 17.

1540 Tons, Pasco, Wash., Snake River cantilever bridge on Primary State Highway 3, Director of Highways, Olympia, bids to Mar. 21.

522 Tons, Allegheny County, Pa., Pennsylvania Turnpike Western Extension, Section 30c, due Mar. 14.

505 Tons, Allegheny County, Pa., Pennsylvania Turnpike Western Extension, Section 30d, due Mar. 14.

197 Tons, Sutton, Northbridge, Douglas and Uxbridge, Mass., bituminous concrete surfacing and three steel stringer bridges with reinforced concrete deck slabs, Martin J. Dalton, Worcester, district engineer. Completion date June 30, 1951.

Fabricated steel awards this week included the following:

1200 Tons, Johnson City, N. Y., extension to power plant, New York Electric & Gas Co., to American Bridge Co., Pittsburgh.

500 Tons, Wilkes-Barre, Pa., store for F. W. Woolworth Co., through Sordoni Construction Co., Wilkes-Barre, Pa., to Anthracite Bridge Co., Scranton, Pa.

323 Tons, Chaisson, Texas, sub station and transmission tower for Gulf States Utilities Co., through Stone and Webster Engineering Corp., Boston, to John Dollinger, Inc., Beaumont, Texas.

270 Tons, Upper Darby, Pa., elementary school, to Robinson Steel Co., Philadelphia.

241 Tons, Lynnfield and Wakefield, Mass., bituminous concrete two steel stringer bridges and two concrete box bridges, through A. V. Taurasi Co., Inc., Somerville, Mass., to Groisser and Shlager Iron Works, Somerville, Mass.

230 Tons, Queens, N. Y., apartment house at 64th avenue and Queens blvd., to Grand Iron Works, N. Y.

165 Tons, Lycoming & Columbia Counties, Pa., Pennsylvania Dept. of Highways, H. R. Miller, Lancaster, low bidder on general contract.

118 Tons, Lincoln, Mass., three span steel stringer bridge, concrete deck and macadam approaches, through F. E. Daddario Corp., Boston, to West End Iron, Cambridge, Mass. Completion date Oct. 31, 1950.

Reinforcing bar awards this week included the following:

2600 Tons, Boston, Veterans' Administration hospital, to Northern Steel Co., Boston.

1181 Tons, Barnstable, Mass., three bridges, Campanelli and Cardi Construction Co., Hillsgrove, R. I., awarded contract.

230 Tons, Philadelphia, Queen Lane filter plant, to Conduit & Foundation Co., Philadelphia, general contractor.

175 Tons, Salem & Gloucester Counties, N. J., New Jersey Turnpike, Contracts 3, 3a, 3b, Nello L. Teer, Durham, N. C., low bidder.

100 Tons, Philadelphia, warehouse for Edgcomb Steel Co., to Bethlehem Steel Co., Bethlehem.

Reinforcing bar inquiries this week included the following:

979 Tons, Allegheny County, Pa., Pennsylvania Turnpike Western Extension, Section 30d, due Mar. 14.

670 Tons, King of Prussia, Pa., Route 769(1a) and Route 4617(1), State Highway & Bridge Authority, due Mar. 3.

491 Tons, Allegheny County, Pa., Pennsylvania Turnpike Western Extension, Section 30c, due Mar. 14.

470 Tons, Pasco, Wash., Snake River bridge and approaches on Primary State Highway 3, Director of Highways, Olympia, bids to Mar. 21.

250 Tons, Plymouth, Mass., bituminous macadam and bituminous concrete with 2 span concrete rigid frame bridge, a single span concrete rigid frame bridge and twin concrete box culvert. Lewis R. Sellow, Middleboro, district engineer. Completion date Oct. 28, 1950.

Warner & Swasey Reports Loss

Cleveland—Strikebound for six months of 1949, Warner & Swasey Co. reported a net loss for the year of $623,599, compared with a net profit of $573,041 for 1948, according to the company's annual report made public this week.

"There is no basis for comparison between the operations during the year 1949 and those of 1948," the report stated, "because we were prevented from operating for the first six months."

Warner & Swasey turret lathes, the report states, continue to be the company's largest single item of machine tool sales. Foreign sales accounted for almost one-fifth of the company's machine tool business in 1949. Although 90 pct of the volume went to continental Europe, shipments were made to 24 foreign countries.

In discussing future outlook, Charles Stilwell, president, said, "Your management feels reasonably optimistic about the year 1950 for the following reasons: It is expected that the year will be one of uninterrupted operation; obsolescence and wear and tear on the machine tool equipment of the country are putting an increasing pressure on the nation's metalworking plants to replace and re-equip and we have every reason to believe that sales of textile machinery will provide a substantial volume."

Paul R. Ramp Passes Away

New York—The foundry industry lost one of its master craftsmen on Jan. 31 with the passing of Paul R. Ramp, 71.

Mr. Ramp was an uncommon man in several respects. In the first place he didn't just decide on the foundry trade; he was born into it. His father and grandfather were skilled foundry artisans, and they passed many of the tricks of their trade, as well as a thorough schooling in fundamentals, on to him.

In addition to his contributions to the art of pouring iron. Mr. Ramp was the author of a number of papers and articles published in the trade press. Spanning the past 30 years, no fewer than 11 of his foundry articles can be found in the pages of THE IRON AGE.

With the passing of Paul R. Ramp the steel and iron industry loses a fine craftsman, but his art lives on in the men who are still contributing the product of his teachings to the industry.

Caterpillar to Build New Plant

Peoria, Ill.—A multi-million dollar plant for manufacture of earthmoving equipment will be constructed near Joliet, Ill., by the Caterpillar Tractor Co.

The plant will include over 700,000 sq ft of manufacturing space for bulldozers, scrapers, wagons and rippers. An office building, a heating plant, and a sewage and water treatment plant will also be built. Construction will start as soon as weather permits.

The new plant is in addition to Caterpillar's $50 million expansion program at Peoria, completed early this year.

New Umpire to Settle Rhubarbs

Detroit — Frederick H. Bullen, has been named temporary umpire between the UAW-CIO and the Ford Motor Co.

Mr. Bullen was formerly executive secretary of the N. Y. State Board of Mediation. He will work with Dr. Harry Schulman who has been Ford-UAW umpire since 1943. Mr Bullen will devote his full time to his new post while Dr. Schulman will continue to spend approximately one week a month hearing cases. He takes office March 15.

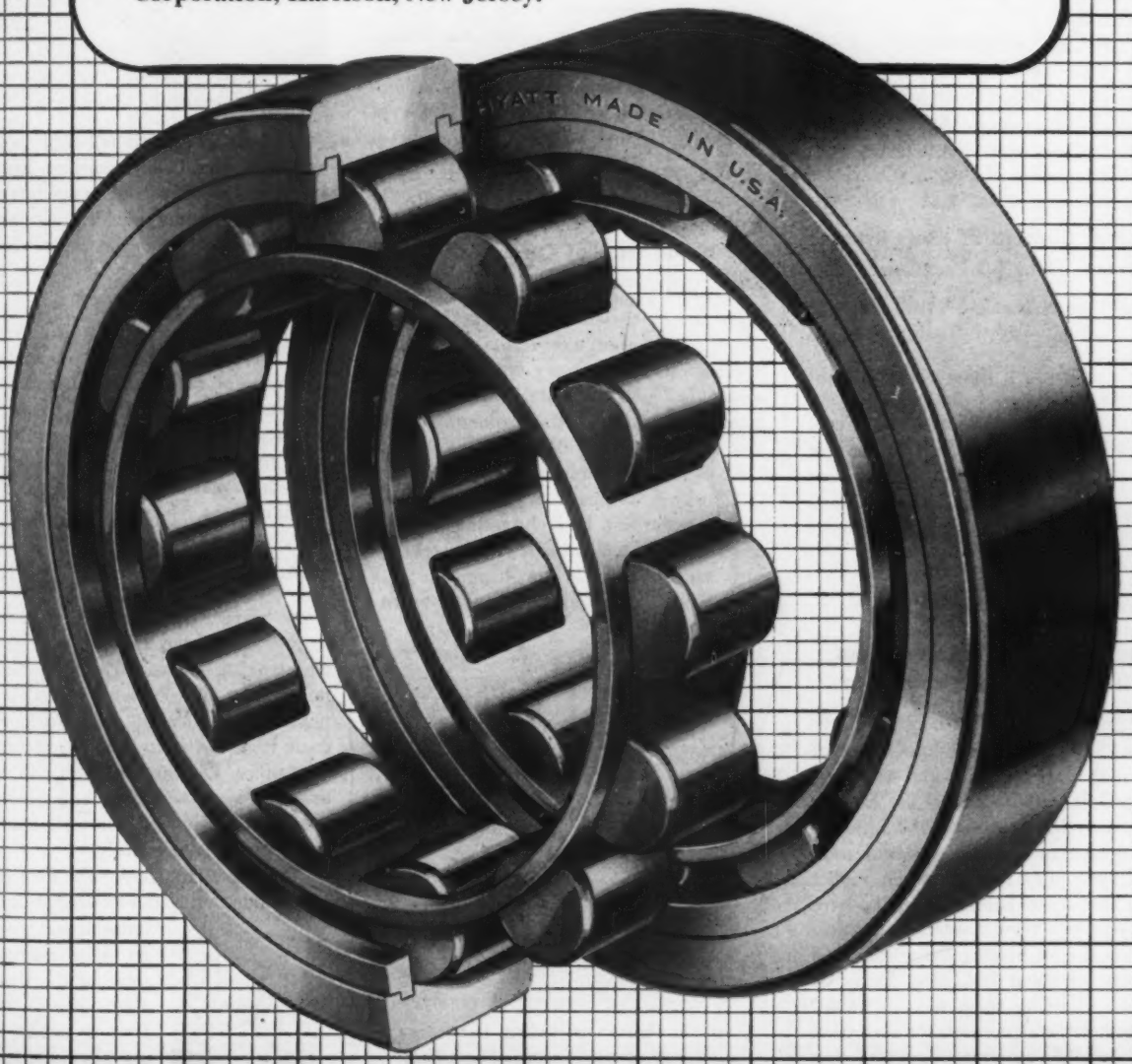
UNIVERSITY OF MICHIGAN LIBRARIES

Designed in . . . for life

The straight cylindrical construction of Hyatt Roller Bearings permits radial loads carried by the bearing to be evenly distributed over the entire length of the rollers. The larger area of contact between the load carrying elements in straight cylindrical bearings results in greater bearing capacity and longer life with less maintenance.

Size for size, Hyatt Hy-Load Roller Bearings offer maximum radial load carrying capacity. They are "designed in" for the life of your equipment.

To get the most out of the equipment you build, sell or buy, be sure that it is equipped with Hyatt Roller Bearings. Let us tell you more about what we can do for you. Write to Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.



HYATT ROLLER BEARINGS

Advertisement

ELECTROMET Data Sheet

A Digest of the Production, Properties, and Uses of Steels and Other Metals

Published by Electro Metallurgical Division, Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N. Y. • In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario

High-Chromium, High-Carbon Iron

. . . the Iron That Hardens as it Wears

In many applications involving extreme abrasion, ordinary work-hardening alloys are not suitable. This is because most of these alloys require a definite pounding action for a martensite transformation, and the scouring action of an abrasive is not sufficient for development of high wear resistance. For this reason, high-chromium, high-carbon irons were developed — irons that wear-harden.

Chromium Content of Irons Ranges from 24 to 30 Per Cent

These irons are made in the electric furnace and have the following composition range:

Chromium	24 to 30 per cent
Carbon	2.25 to 2.85 per cent
Manganese	0.50 to 1.25 per cent
Silicon	0.50 to 1.50 per cent
Nickel	minimum
Iron	balance

Irons of this composition are readily castable by steel casting techniques.

Development of Greater Wear Resistance by Heat Treatment

Structurally, these irons consist of primary iron-chromium carbides in a matrix of iron-chromium solid solution and secondary iron-chromium carbides. They are hard in the as-cast condition (500 to 550 Brinell), but when they are given an austenitization heat-treatment they develop much higher hardness (about 600 Brinell), and also have greatly improved wear resistance. Austenitization consists of heating these irons to a temperature of about 2012 deg. F. for an hour, then allowing them to cool in air. This heat-treatment promotes the formation of very unstable austenite—austenite that will transform to a harder martensitic end-product even under rubbing or mild impingement action. Austenitization has been found to be far more effective in increasing wear resistance than the promotion of unstable austenite by the addition of ferrite-forming alloying elements.

High-chromium, high-carbon irons can also be annealed to sufficiently low-hardness values for grinding or simple machining. Hardnesses as low as 350 to 450 Brinell can be obtained by heating the castings to temperatures of 1400 to 1450 deg. F. for 12 to 24 hours, then allowing them to cool in air.

Irons Have Wear Resistance Many Times That of Other Alloys

Austenitized high-chromium irons have been known to last as much as 21 times longer than other wear-resistant alloys in applications involving extreme frictional abrasion. These applications include sand-blast nozzles and liners, pantograph contact shoes, grinding disks, pulleys, chute-liner plates, dredge-pump liners, and rollers for crushing various hard materials.

In a recent test, high-chromium iron was compared to special wear-resistant steel castings as the material for hammers in a machine that was used to crush abrasive material. The chrome-iron hammers were found to have almost 7 times the wear resistance of the steel castings.

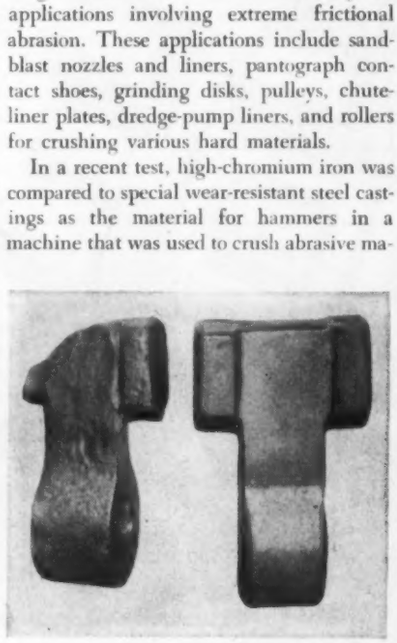


Fig. 1. After crushing the same amount of abrasive material in a hammer mill, the badly worn steel casting (left) had a weight loss of 37 per cent while the high-chromium iron casting (right) lost only 5.5 per cent.

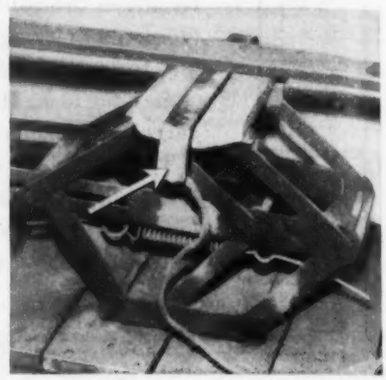


Fig. 2. This chrome-iron pantograph shoe had a service life of about 10 years. A tool steel that was used in similar service wore out in about 3 or 4 months; copper lasted about 24 hours.

When thoroughly backed up with zinc, the iron also has enough shock resistance to be used effectively as crushing hammers and jaw plates for many severe rock-handling jobs.

Metallurgical Service Available

For years, ELECTROMET high-carbon ferrochrome has been used to make chromium additions to abrasion-resistant high-chromium irons. If you should have any questions about either the production or use of these irons, write to the nearest ELECTROMET office. Our metallurgists will be glad to give many valuable suggestions and recommendations on how to make or use this iron most effectively.

Write for a free copy of the ELECTROMET publication, "Abrasion-Resistant High-Chromium Iron." This booklet is a collection of some of the best available information on how to make and to use abrasion-resistant iron castings most efficiently.

The term "Electromet" is a registered trademark of Union Carbide and Carbon Corporation.

Briefs and Bulletins

iron ore—Consumption of Lake Superior district iron ore by U. S. and Canadian blast furnaces totaled 6,740,047 gross tons in January, compared to 6,760,481 gross tons in December, 1949, and 7,590,471 gross tons in January, 1949, according to Lake Superior Iron Ore Assn. Stocks of iron ore on hand at furnaces and Lake Erie docks totaled 32,003,928 gross tons Feb. 1, compared to 38,628,510 gross tons a month ago, and 31,904,181 gross tons on Feb. 1, 1949.

revises extras—American Steel & Wire Co. has announced new extras on cold strip and spring steel, effective Feb. 24. Strip extra revisions range from an increase of $5.00 to $11.75 per ton on quantity extras. Coppering was advanced $2 a ton and increases ranging from $10 to $20 per ton on width for round edge stock. On cold-rolled spring steel, extras on the No. 3 edge have been eliminated and the No. 3 edge is now considered the base edge.

off again—Last week there was an agreement between the union and management negotiation committees on the seven week old Philadelphia-Camden foundry strike. The agreement provided for a 1 1/3 cents per hour welfare package increase. On Monday the union failed to ratify the agreement and foundry operators are seriously concerned with prospects for continued deterioration of their business.

cutbacks—Weirton Steel Co. planned to continue normal operations through this week. Wheeling Steel Corp. was down to 75 pct of capacity on steelmaking and 35 pct on coke producing, but this was subject to further reductions at any time.

stranglehold—Inland Steel Co. may operate only two of its eight blast furnaces this week. Also in the Chicago area Youngstown Sheet and Tube will bank a blast furnace and virtually stop making bessemer.

unwilling—The Progressive Mine Workers in Illinois, who had been working a full five-day week, went on strike Wednesday, Feb. 22. The 8000 Progressive Miners in Illinois account for about 22 pct of the coal normally mined in the state.

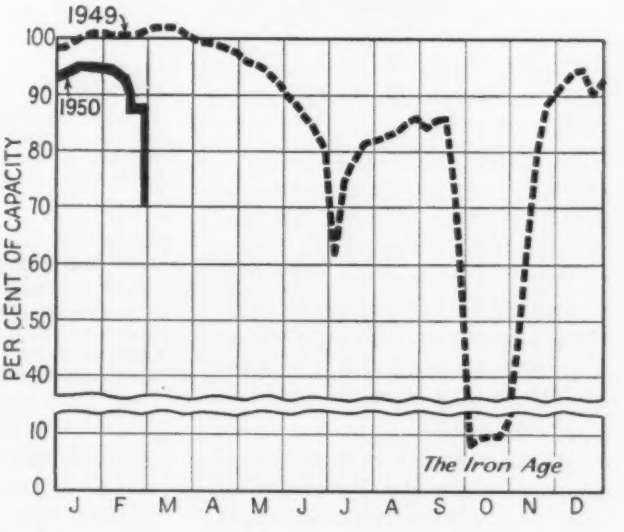
approved—Stockholders of U. S. Steel Corp. overwhelmingly approved the employee pension and insurance program recommended by the management at a special meeting held Monday in Hoboken, N. J. About 400 stockholders attended the meeting.

electrical sheets—Carnegie-Illinois Steel Corp. has announced price reductions of $5 per ton in armature and electrical grade, in both cut lengths and coils. Transformer grade 90 was reduced $8 per ton and transformer grade 80, $13 per ton. The reductions were effective Feb. 15. The company also announced that it is producing transformer grade 73 at a price of $14.70. Inland Steel and Armco had announced similar reductions in armature and electrical grades. The new transformer grade prices now also conform with Armco's.

cave-in—The first big steel producer to cave in because of the coal strike was Jones and Laughlin Steel Corp., which by last week had shut down everything at its Pittsburgh and Aliquippa, Pa., plants with the exception of one blast furnace and one battery of coke ovens. These were limited to a maintenance level. Some 23,000 employees were idled.

utility reduction—Starting Monday Feb. 27, utility power buyers in the Chicago area have been ordered to cut electricity use by 25 pct. This will affect Wisconsin, Republic Steel, and Gary Sheet and Tin. None of these knows how much, but they do not expect their output to drop by a full 25 pct. More like 20 pct, they guess.

Steel Operations



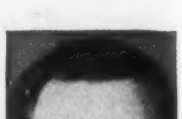
District Operating Rates—Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
February 19	90.0*	94.0*	71.5	76.0	95.5	101.5	89.5	80.0	98.0*	83.7	78.0	88.9	98.6	86.5
February 26	54.5	90.5	61.0	40.0	92.0	96.0	89.5	58.0	98.0	71.5	73.0	68.9	98.6	70.0

* Revised. ** Estimated.

Nonferrous METALS OUTLOOK

Market Activities



by John Anthony

Coal strike deadens metal markets . . . Prompt tin offered at 74⅛¢ . . . January copper consumption by fabricators rises . . . Mine subsidies stymied.

New York—The coal strike is having a very significant quieting effect on the metal markets. Tin, zinc, copper and brass mill products are feeling the full impact of consumers' unwillingness to build unbalanced inventories while steel is not obtainable. Some observers believe that the effects of the coal strike may linger on in the metal markets despite a strike settlement.

Right now the interest in tin is nil. Offerings of prompt are being made at 74⅛¢. But traders say there isn't too much around. March or April is offered at 74¢. RFC was still pricing Grade A at 74½¢ early this week, but judging by past experience a reduction in the RFC price may be in the cards.

Offerings of copper and brass scrap are reported to have slowed up some since the ¼¢ reduction made by refiners two weeks ago.

January Copper Use Up

The January figures relating to operations of the brass mills in terms of copper are very significant. January consumption of copper by fabricators rose to 108,921 short tons from the December low point of 83,437 tons. The December figure was low because of customary year end factors, but January consumption has resumed the preyearend rate.

Statistics indicate that for some time fabricators have been buying more copper than they have been consuming. Sales of refined copper to fabricators in January were 122,327 tons, while sales of fabricated products required only 95,440 tons, purchases exceeding sales by 26,887 tons during the month.

For a long time there has been a trend resulting in the transfer of inventories of copper from producers to fabricators. The high point in producers' inventories was at the end of August when their stocks of refined copper totaled 217,167 tons. At the end of January this figure had been cut in half to 101,070 tons. Fabricators' stocks at the end of August were 379,190 tons, but by the end of January they had climbed to 450,353 tons.

Mine Subsidies Hit Roadblock

Legislation granting subsidy payments to copper, lead, and zinc producers hit another road block in Congress this week. The House Rules Committee, reversing approval it granted last week to the subsidy bill, on Monday declined to clear the controversial measure for debate on the House floor.

NONFERROUS METALS PRICES

	Feb. 23	Feb. 24	Feb. 25	Feb. 27	Feb. 28
Copper, electro, Conn.	18.50	18.50	18.50	18.50	18.50
Copper, Lake, Conn.	18.625	18.625	18.625	18.625	18.625
Tin, Straits, New York	74.50	74.50	74.50	74.50	74.50
Zinc, East St. Louis	9.75	9.75	9.75	9.75	9.75
Lead, St. Louis	11.80	11.80	11.80	11.80	11.80

Note: Quotations are going prices.

MONTHLY AVERAGE PRICES

The average prices of the major nonferrous metals in February based on quotations appearing in THE IRON AGE, were as follows:

	Cents Per Pound
Electrolytic copper, Conn. Valley	18.50
Lake copper, Conn. Valley	18.625
Straits tin, New York	74.50
Zinc, East St. Louis	9.75
Zinc, New York	10.47
Lead, St. Louis	11.80
Lead, New York	12.00

Mill Products

Aluminum

(Base prices, cents per pound, base 30,000 lb, f.o.b. shipping point, freight allowed)

Flat Sheet: 0.188 in., 2S, 3S, 26.9¢; 4S, 61S-O, 28.3¢; 52S, 30.9¢; 24S-O, 24S-OAL, 29.3¢; 75S-O, 75S-OAL, 36.3¢; 0.081 in., 2S, 3S, 27.9¢; 4S, 61S-O, 30.2¢; 52S, 32.3¢; 24S-O, 24S-OAL, 30.9¢; 75S-O, 75S-OAL, 38¢; 0.032 in., 2S, 3S, 29.5¢; 4S, 61S-O, 33.5¢; 52S, 36.2¢; 24S-O, 24S-OAL, 37.9¢; 75S-O, 75S-OAL, 47.6¢.

Plate: ¼ in., and heavier: 2S, 3S, F, 23.8¢; 4S-F, 26¢; 52S-F, 27.1¢; 61S-O, 26.6¢; 24S-F, 24S-FAL, 27.1¢; 75S-F, 75S-FAL, 33.9¢.

Extruded Solid Shapes: Shape factors 1 to 4, 33.6¢ to 64¢; 11 to 13, 34.6¢ to 76¢; 23 to 25 36.7¢ to $1.05; 35 to 37, 44¢ to $1.53; 47 to 49, 63.5¢ to $2.20.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 34¢ to 30.5¢; Cold-finished, 0.375 to 3 in., 2S, 3S, 36.5¢ to 32¢.

Screw Machine Stock: Rounds, 11S-T3, R317-T4; ⅛ to 11/32 in., 49¢ to 38¢; ⅜ to 1½ in., 37.5¢ to 35.5¢; 1 9/16 to 3 in., 35.5¢ to 32.5¢; 17S-T4 lower by 1¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in.; 2S, 36¢ to 26.5¢; 52S, 44¢ to 32¢; 56S, 47¢ to 33.5¢; 17S-T4, 50¢ to 34.5¢; 61S-T4, 44.5¢ to 34¢; 75S-T-6, 76¢ to 55¢.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed)

Sheets and Plate: Ma, FSa, ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 12, 63¢-65¢; 14, 69¢-74¢; 16, 76¢-81¢; 18, 84¢-89¢; 20, 96¢-$1.01; 22, $1.22-$1.31; 24, $1.62-$1.75. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., ¼ to 0.311, 58¢; ⅓ to ¾, 46¢; 1¼ to 1.749, 43¢; 2⅓ to 5, 41¢. Other alloys higher. Base: Up to ⅜ in. diam., 10,000 lb; ⅜ in. to 1¾ in., 20,000 lb; 1⅜ in. and larger, 30,000 lb.

Extruded Square, Hex. Bar: M, size across flats, in., ¼ to 0.311, 61¢; ⅓ to 0.749, 48¢; 1¼ to 1.749, 44¢; 2⅓ to 4, 42¢. Other alloys higher. Base: Up to ⅜ in. diam, 10,000 lb; ⅜ in. to 1⅜ in., 20,000 lb; 1⅜ in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangle: M, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb per ft, per. up to 3.5 in., 55¢ 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 44¢; 4 to 6 lb per ft, per. up to 28 in., 43¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ lb to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam. in., 0.049 to 0.057, ¼ to 5/16, $1.14; 5/16 to ⅜, $1.02; ½ to ⅝, 76¢; 1 to 2 in., 65¢; 0.065 to 0.082, ⅜ to 7/16, 85¢; ⅝ to ¾, 62¢; 1 to 2 in., 57¢; 0.165 to 0.219, ⅞ to 1, 84.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Nickel and Monel

(Base prices, cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	60	47
Strip, cold-rolled	66	50
Rods and bars	56	45
Angles, hot-rolled	56	45
Plates	58	46
Seamless tubes	89	80
Shot and blocks	..	40

Copper, Brass, Bronze

(Cents per lb, freight prepaid on 200 lb)

	Sheets	Rods	Extruded Shapes
Copper	32.18	....	31.78
Copper, h-r	....	28.03	....
Copper, drawn	....	29.28	....
Low brass	30.12	29.81	33.03*
Yellow brass	28.69	28.38	31.70*
Red brass	30.60	30.29	33.51*
Naval brass	33.51	27.57	28.82
Leaded brass	....	23.19	27.22
Com'l bronze	31.61	31.30	34.27*
Manganese bronze	37.01	30.92	32.42
Phosphor bronze	50.90	51.15	....
Muntz metal	31.58	27.14	28.39
Everdur, Herculoy, Olympic, etc.	37.19	36.14	....
Nickel silver, 10 pct	39.66	41.87	46.80
Arch. bronze	....	....	27.22

*Seamless tubing.

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, 10,000 lb, freight allowed	17.00
Aluminum pig	16.00
Antimony, American, Laredo, Tex.	27.25
Beryllium copper, 3.75-4.25% Be dollars per lb contained Be	$24.50
Beryllium aluminum 5% Be, dollars per lb contained Be	$52.00
Bismuth, ton lots	$2.00
Cadmium, del'd	$2.00
Cobalt, 97-99% (per lb)	$1.80 to $1.87
Copper, electro, Conn. Valley	18.50
Copper, lake, Conn. Valley	18.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$100 to $110
Lead, St. Louis	11.80
Lead, New York	12.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, 100 to 5000 lb	36¢ to 38¢
Mercury, dollars per 76-lb flask f.o.b. New York	$70 to $73
Nickel, electro, f.o.b. New York	42.97
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$66 to $69
Silver, New York, cents per oz.	73.25
Tin, New York	74.50
Zinc, East St. Louis	9.75
Zinc, New York	10.47
Zirconium copper, 10-12 pct Zr, per lb contained Zr	$12.00

Remelted Metals

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	16.75-18.25
No. 120	16.25-17.75
No. 123	15.75-17.25
80-10-10 ingot	
No. 305	21.75
No. 315	19.75
88-10-2 ingot	
No. 210	27.75
No. 215	25.25
No. 245	18.25-21.00
Yellow ingot	
No. 405	14.25-16.00
Manganese bronze	
No. 421	20.75

Aluminum Ingot

(Cents per lb, lot of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	18.50-19.00
0.60 copper, max.	18.25-18.75
Piston alloys (No. 122 type)	16.50-17.00
No. 12 alum. (No. 2 grade)	16.25-16.75
108 alloy	16.75-17.25
195 alloy	17.50-18.00
13 alloy	18.50-19.00
AXS-679	16.75-17.25

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	17.75-18.50
Grade 2—92-95%	16.75-17.50
Grade 3—90-92%	15.75-16.50
Grade 4—85-90%	15.25-15.75

Electroplating Supplies

Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	35½
Electrodeposited	29¾
Rolled, oval, straight, delivered	33
Ball anodes	33¾
Brass, 80-20	
Cast, oval, 15 in. or longer	31¼
Zinc, oval, 99.886, f.o.b. Detroit	17¼
Ball anodes	16¼
Nickel 99 pct plus	
Cast	59.00
Rolled, depolarized	60.00
Cadmium	$2.15
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	79

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	46½
Copper sulfate, 99.5 crystals, bbl	11.10
Nickel salts, single or double, 4-100 lb bags, frt allowed	18.00
Nickel chloride, 300 lb bbl	24.50
Silver cyanide, 100 oz lots, per oz	59
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc sulfate, 89 pct granular	11.00
Zinc cyanide, 100 lb drums	38.00

Scrap Metals

Brass Mill Scrap

(Cents per pound; add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	15½	14¾
Yellow brass	12½	11⅝
Red brass	14	13¼
Commercial bronze	14¼	13½
Manganese bronze	12	11¼
Leaded brass rod ends	12¼	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	15.25
No. 2 copper wire	14.25
Light copper	13.25
Refinery brass	13.50*
Radiators	9.75

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper wire	15.25
No. 2 copper wire	14.25
Light copper	13.25
No. 1 composition	12.25
No. 1 comp. turnings	11.75
Rolled brass	10.50
Brass pipe	11.00
Radiators	10.00
Heavy yellow brass	9.75
Aluminum	
Mixed old cast	9.50-10.00
Mixed old clips	9.25- 9.50
Mixed turnings, dry	7.00- 7.50
Pots and pans	9.25- 9.50
Low copper	11.50-12.00

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	13¾—14
No. 2 heavy copper and wire	12¾—13
Light copper	11½—11¾
Auto radiators (unsweated)	8½— 8¾
No. 1 composition	11 —11¼
No. 1 composition turnings	10½—10¾
Clean red car boxes	9 — 9¼
Cocks and faucets	9 — 9¼
Mixed heavy yellow brass	7¼— 7½
Old rolled brass	8½— 8¾
Brass pipe	9¼— 9½
New soft brass clippings	10½—11
Brass rod ends	9¾—10
No. 1 brass rod turnings	9½— 9¾

Aluminum

Alum. pistons and struts	4½— 5
Aluminum crankcases	7 — 7½
2S aluminum clippings	10½—11
Old sheet and utensils	7 — 7½
Borings and turnings	4
Misc. cast aluminum	7 — 7½
Dural clips (24S)	7 — 7½

Zinc

New zinc clippings	6½— 7
Old zinc	4 — 4½
Zinc routings	2½— 3
Old die cast scrap	3¼— 3½

Nickel and Monel

Pure nickel clippings	21 —23
Clean nickel turnings	14 —15
Nickel anodes	20 —22
Nickel rod ends	20 —22
New Monel clippings	12 —14
Clean Monel turnings	8 — 9
Old sheet Monel	10 —12
Old Monel castings	9 —10
Inconel clippings	11 —13
Nickel silver clippings, mixed	8 —10
Nickel silver turnings, mixed	6 — 7

Lead

Soft scrap, lead	9½— 9¾
Battery plates (dry)	4¼— 4½

Magnesium

Segregated solids	9 —10
Castings	5½— 6½

Miscellaneous

Block tin	60 —62
No. 1 pewter	38 —40
No. 1 auto babbitt	35 —37
Mixed common babbitt	9 — 9¼
Solder joints	11½—12
Siphon tops	40 —42
Small foundry type	11½—12
Monotype	10½—11
Lino. and stereotype	9¾—10¼
Electrotype	8¼— 8½
New type shell cuttings	11½—11¾
Hand picked type shells	4 — 4½
Lino. and stereo. dross	4¾— 5
Electro. dross	2¾— 3

MARKETS—PRICES—TRENDS

SCRAP
Iron & Steel

Market Quiet, General Undertone Strong

The market opened the week on a quiet note, taking its cue from the coal uncertainty. Some confusion was also obvious: No. 1 went up in Cincinnati, and down in Pittsburgh.

Where mills had better than average coal supplies and operations held up there was not as much softness in the steelmaking grades. Pittsburgh mills had just about reached the safe limit on coal use this week though Chicago producers were a little better fixed.

Cast grades became firmer. This was due to the increase in the foundry business in the Chicago area and the ending of the foundry strike in Philadelphia. Increased purchases by pipe shops in Birmingham caused the prices of No. 1 cupola cast and stove plate to advance $1. In Boston, however, the cast business continues bad although the prices have not dropped.

In spite of the price changes and the lack of activity in some spots, the general undertone of the market is strong. Reasons for this include: (1) Strong steel demand; and (2) mill use of scrap from inventory during the coal shortage.

Brokers are marking time until after the coal trouble is cleared up, the feeling being that they might get in a jam if they were to make heavy commitments now. After the strike some exploratory deals will be made until the price trend is clearer.

PITTSBURGH—A district mill bought a representative tonnage of No. 1 heavy melting steel at $31.00, a decline of $1 from last week. It was understood that 7000 tons of a 10,000 ton order called for a price of $31.00, while the remainder was sold for $31.50. Short turnings fell off $1 to a top of $25, the price paid by a large consumer for a considerable tonnage. Low phos. plate was up 50¢ to $34.00, top.

CHICAGO—The scrap market remains quiet, with the trade holding activity at a minimum awaiting definite action in the coal situation. One large mill placed orders early last week, but since dropped out of the market. There is evidence of greater strength in foundry scrap reflecting increased foundry business. Blast furnace scrap, on the other hand, seems weak. No. 1 dealers bundle prices last week were misprinted at $24.00 to $27.00. The figure should have been $25.00 to $26.50.

PHILADELPHIA — The market here continued on its relatively inactive course here. Prices for heavy melting grades are unchanged. Cast grades strengthened with the ending of the foundry strike here early this week. Prices of yard cast were $1.00 higher, but breakable increased $2.50. The turnings market was down by about 50¢. Rails were down $1.00.

NEW YORK—Except for No. 2 heavy melting steel, prices are unchanged here. Volume was low early in the week, pending outcome of the coal strike. Brokers are looking for an active demand once the coal strike is settled. Not knowing just how active it will be they will go slowly on taking new orders. Although some brokers are still buying No. 2 heavy melting steel at $18.00, others have lowered their buying prices and a $1.00 a ton spread has opened up in this grade.

DETROIT—No large scale commitments are being made here pending final settlement of the coal strike. While odd carload lots are finding a home, according to trade sources scrap buyers generally are marking time until the present confusion is cleared. Meanwhile, the trend of the market is on the firm side. Small advances were registered this week for blast furnace grades and cast grades.

CLEVELAND—A spotty but unchanged scrap market prevailed here and in the Valley this week. Undertone of the market is strong, despite declining operations. Industrial lists were reported bringing prices higher than market quotations for No. 1 grades. Cast grades continue to move for openhearth consumption which has firmed up the foundry market. Dealer grades are very spotty and showing little evidence of strength.

ST. LOUIS—The supply of pig iron from the local maker being in prospect of being shut off and a possible shortage from other sources, has caused a strengthening for the market for cast iron grades, which openhearth furnaces plan to use. The demand from foundries has been off.

BOSTON—Dealers and brokers here are crying the blues. Said one: "The cast business was bad before but it's even worse now." Though people handling cast say they might as well close up shop the fact is that prices have not collapsed as might be expected. There has been some activity in steelmaking grades but even that is reportedly very low this week. Prices remain unchanged except for a 50¢ drop in shoveling turnings.

BUFFALO—A marked shrinkage in the movement of scrap from collection sources into dealers yards was noted during the week. Zero weather and a general falling off in industrial operations resulting from coal strike were reflected in lighter yard receipts. The decline in collections has a steadying effect on the market during the present stalemate. Buying interest is virtually nil, but a survey of dealers revealed that a feeling prevails at least for the present that new business would be placed at current levels if the industrial strike picture would clear. The cast market continues on the weak side. There is some agitation for lower prices but last sales took place within quoted ranges.

CINCINNATI—Purchase of representative tonnages of steel mill grades by major consumers at 50¢ to $1.00 a ton over last week's quotations spurred trading here. Undertone of the market for most grades except No. 2 steel is very strong, a possible omen of quick settlement of the coal strike, according to trade sources. The market shows definite demand with material moving out of this district to Northern consumers. Foundry grades are displaying sympathetic strength.

BIRMINGHAM—With pipe shops in this area increasing their purchases of cast grades, the price for No. 1 cupola cast and stove plate has advanced $1. A sharp drop in steel operations as a result of the coal strike is reflected in a lack of demand for openhearth grades.

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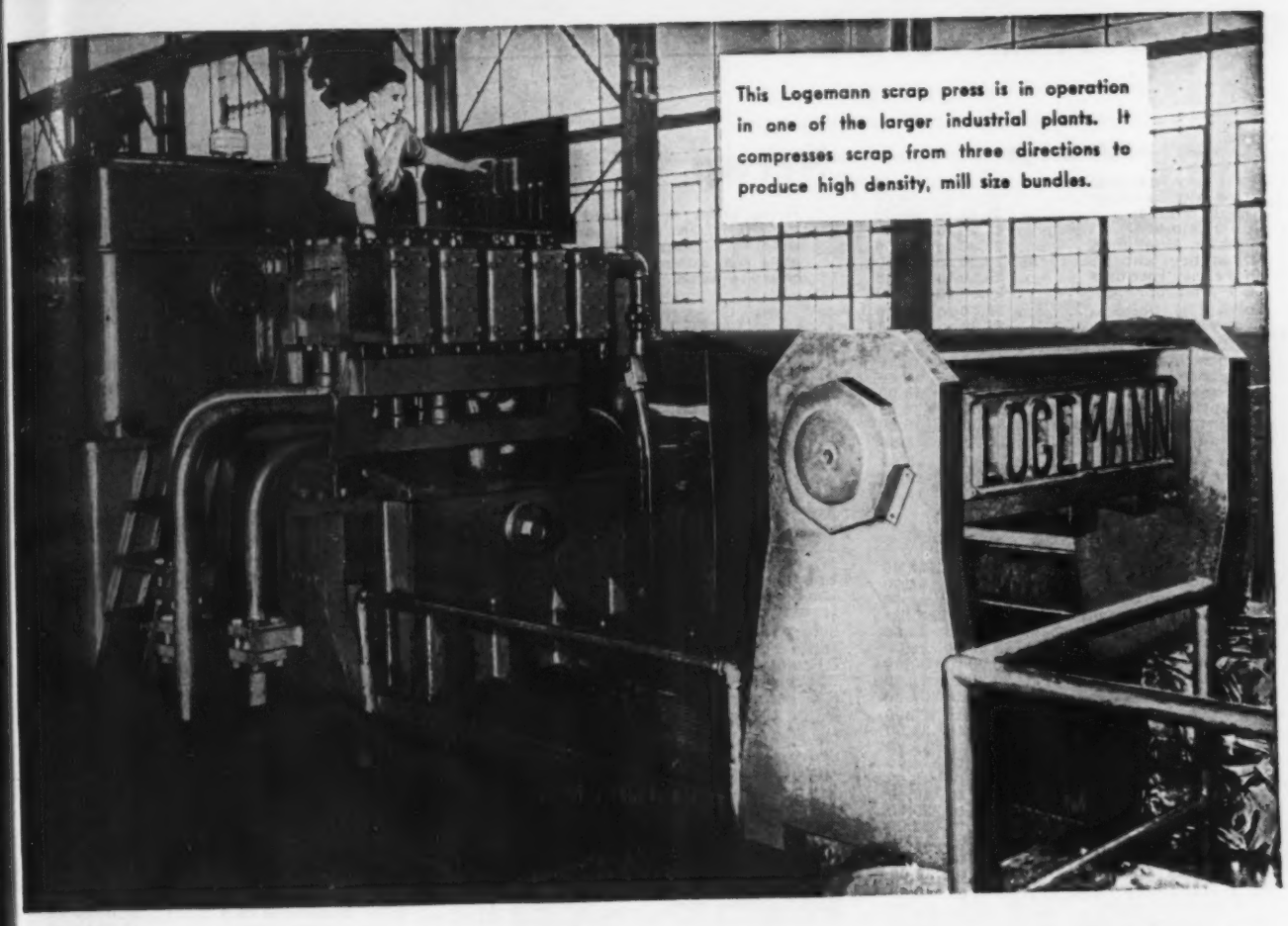

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Scrap IRON & STEEL Prices

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$30.50 to $31.00
No. 2 hvy. melting	27.50 to 28.00
No. 1 bundles	30.50 to 31.00
No. 2 bundles	23.50 to 24.00
Machine shop turn.	22.00 to 22.50
Mixed bor. and ms. turns.	22.00 to 22.50
Shoveling turnings	24.50 to 25.00
Cast iron borings	24.50 to 25.00
Low. phos. plate	33.50 to 34.00
Heavy turnings	27.00 to 28.00
No. 1 RR. hvy. melting	33.00 to 33.50
Scrap rails, random lgth.	35.50 to 36.50
Rails 2 ft and under	39.00 to 40.00
RR. steel wheels	35.50 to 36.00
RR. spring steel	35.50 to 36.00
RR. couplers and knuckles	35.50 to 36.00
No. 1 machinery cast.	37.00 to 38.00
Mixed yard cast.	34.00 to 35.00
Heavy breakable cast.	31.00 to 32.00
Malleable	33.00 to 34.00

*See market summary p. 117

Chicago

No. 1 hvy. melting	$27.00 to $28.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 factory bundles	27.00 to 28.00
No. 1 dealers' bundles	25.00 to 26.50*
No. 2 dealers' bundles	23.00 to 24.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	20.00 to 21.00
Low phos. forge crops	32.00 to 33.00
Low phos. plate	30.50 to 31.50
No. 1 RR. hvy. melting	29.00 to 30.00
Scrap rails, random lgth.	33.00 to 34.00
Rerolling rails	41.00 to 42.00
Rails 2 ft and under	39.00 to 40.00
Locomotive tires, cut	34.00 to 35.00
Cut bolsters & side frames	31.00 to 32.00
Angles and splice bars	35.00 to 36.00
RR. steel car axles	42.00 to 43.00
RR. couples and knuckles	32.00 to 33.00
No. 1 machinery cast.	39.00 to 40.00
No. 1 agricul. cast.	37.00 to 38.00
Heavy breakable cast.	30.00 to 31.00
RR. grate bars	29.00 to 30.00
Cast iron brake shoes	30.00 to 31.00
Cast iron car wheels	36.00 to 37.00
Malleable	37.00 to 38.00

*See market summary p. 134.

Philadelphia

No. 1 hvy. melting	$22.50 to $23.50
No. 2 hvy. melting	20.50 to 21.50
No. 1 bundles	22.50 to 23.50
No. 2 bundles	17.50 to 18.50
Machine shop turn.	15.00 to 15.50
Mixed bor. and turn.	14.00 to 14.50
Shoveling turnings	17.00 to 17.50
Low phos. punchings, plate	25.50 to 26.00
Low phos. 5 ft and under	24.50 to 25.00
Low phos, bundles	24.50 to 25.00
Hvy. axle forge turn.	22.50 to 23.50
Clean cast chem. borings	28.00 to 29.00
RR. steel wheels	28.00 to 29.00
RR. spring steel	28.00 to 29.00
Rails 18 in. and under	35.00 to 36.00
No. 1 machinery cast.	35.00 to 36.00
Mixed yard cast.	30.00 to 31.00
Heavy breakable cast.	33.00 to 34.00
Cast iron carwheels	35.00 to 36.00
Malleable	34.00 to 35.00

Cleveland

No. 1 hvy. melting	$28.00 to $28.50
No. 2 hvy. melting	25.50 to 26.00
No. 1 busheling	28.00 to 28.50
No. 1 bundles	28.00 to 28.50
No. 2 bundles	22.50 to 23.00
Machine shop turn.	18.50 to 19.00
Mixed bor. and turn.	20.50 to 21.00
Shoveling turnings	20.50 to 21.00
Cast iron borings	20.50 to 21.00
Low phos. 2 ft and under	29.00 to 29.50
Steel axle turn.	27.00 to 27.50
Drop forge flashings	28.00 to 28.50
No. 1 RR. hvy. melting	32.00 to 32.50
Rails 3 ft and under	42.00 to 43.00
Rails 18 in. and under	43.00 to 44.00
No. 1 machinery cast.	42.00 to 43.00
RR. cast.	42.00 to 43.00
RR. grate bars	30.00 to 31.00
Stove plate	34.00 to 35.00
Malleable	38.00 to 39.00

Youngstown

No. 1 hvy. melting	$31.50 to $32.00
No. 2 hvy. melting	27.50 to 28.00
No. 1 bundles	31.50 to 32.00
No. 2 bundles	$24.50 to $25.00
Machine shop turn.	21.00 to 21.50
Shoveling turnings	23.00 to 23.50
Cast iron borings	23.00 to 23.50
Low phos. plate	32.50 to 33.00

Buffalo

No. 1 hvy. melting	$27.50 to $28.00
No. 2 hvy. melting	25.50 to 26.00
No. 1 busheling	25.50 to 26.00
No. 1 bundles	26.50 to 27.00
No. 2 bundles	24.00 to 24.50
Machine shop turn.	18.00 to 18.50
Mixed bor. and turn.	19.00 to 19.50
Shoveling turnings	20.50 to 21.00
Cast iron borings	19.50 to 20.00
Low phos. plate	29.00 to 29.50
Scrap rails, random lgth.	33.50 to 34.00
Rails 2 ft and under	38.50 to 39.00
RR. steel wheels	33.00 to 33.50
RR. spring steel	33.00 to 33.50
RR. couplers and knuckles	33.00 to 33.50
No. 1 machinery cast.	35.00 to 36.00
No. 1 cupola cast.	31.00 to 32.00
Stove plate	30.00 to 31.00
Small indus. malleable	30.00 to 30.50

Birmingham

No. 1 hvy. melting	$24.00
No. 2 hvy. melting	22.00
No. 2 bundles	20.00
No. 1 busheling	23.00
Machine shop turn.	$16.00 to 17.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	19.00
Bar crops and plate	27.00 to 28.00
Structural and plate	27.00 to 28.00
No. 1 RR. hvy. melt.	26.00 to 27.00
Scrap rails, random lgth.	29.00 to 30.00
Rerolling rails	33.00 to 34.50
Rails 2 ft and under	35.50 to 36.00
Angles & splice bars	34.00 to 35.00
Std. steel axles	28.00 to 29.00
No. 1 cupola cast.	35.00 to 36.00
Stove plate	30.00 to 31.00
Cast iron carwheels	28.00 to 29.00

St. Louis

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	24.00 to 25.00
No. 2 bundled sheets	24.00 to 25.00
Machine shop turn.	14.00 to 15.00
Shoveling turnings	18.00 to 19.00
Rails, random lengths	30.00 to 31.00
Rails 3 ft and under	35.00 to 36.00
Locomotive tires, uncut	27.00 to 28.00
Angles and splice bars	34.00 to 35.00
Std. steel car axles	39.00 to 41.00
RR. spring steel	30.00 to 31.00
No. 1 machinery cast.	37.00 to 38.00
Hvy. breakable cast.	30.00 to 31.00
Cast iron brake shoes	29.00 to 30.00
Stove plate	28.00 to 29.00
Cast iron car wheels	35.00 to 36.00
Malleable	31.00 to 33.00

New York

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$20.25 to $20.75
No. 2 hvy. melting	17.00 to 18.00
No. 2 bundles	15.50 to 16.00
Machine shop turn.	10.50 to 11.00
Mixed bor. and turn.	10.50 to 11.00
Shoveling turnings	11.00 to 11.50
Clean cast chem. bor.	23.00 to 24.00
No. 1 machinery cast.	26.50 to 27.00
Mixed yard cast.	25.00 to 25.50
Charging box cast.	24.50 to 25.00
Heavy breakable cast.	24.50 to 25.00
Unstrp. motor blocks	19.00 to 20.00

Boston

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$19.50 to $20.00
No. 2 hvy. melting	16.50 to 17.00
No. 1 bundles	19.50 to 20.00
No. 2 bundles	$15.00 to $15.50
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	10.00 to 11.00
Shoveling turnings	12.00 to 12.50
No. 1 busheling	17.00 to 17.50
Clean cast chem. borings	18.00 to 18.50
No. 1 machinery cast.	25.50 to 26.50
No. 2 machinery cast.	21.00 to 22.00
Heavy breakable cast.	22.00 to 23.00
Stove plate	20.00 to 21.00

Detroit

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$21.00 to $22.00
No. 2 hvy. melting	19.00 to 20.00
No. 1 bundles	22.00 to 23.00
New busheling	21.00 to 22.00
Flashings	21.00 to 22.00
Machine shop turn.	14.50 to 15.00
Mixed bor. and turn.	14.50 to 15.00
Shoveling turnings	15.50 to 16.50
Cast iron borings	15.50 to 16.50
Low phos. plate	22.00 to 23.00
No. 1 cupola cast.	33.00 to 34.00
Heavy breakable cast.	26.00 to 27.00
Stove plate	27.00 to 28.00
Automotive cast.	35.00 to 36.00

Cincinnati

Per gross ton, f.o.b. cars:

No. 1 hvy. melting	$26.50 to $27.00
No. 2 hvy. melting	21.50 to 22.00
No. 1 bundles	26.50 to 27.00
No. 2 bundles	18.00 to 18.50
Machine shop turn.	13.50 to 14.00
Mixed bor. and turn.	14.50 to 15.00
Shoveling turnings	16.50 to 17.00
Cast iron borings	16.50 to 17.00
Low phos. 18 in. under	33.00 to 33.50
Rails, random lengths	33.00 to 34.00
Rails, 18 in. and under	42.00 to 43.00
No. 1 cupola cast	36.00 to 37.00
Hvy. breakable cast	32.00 to 33.00
Drop broken cast	41.00 to 42.00

San Francisco

No. 1 hvy. melting		$20.00
No. 2 hvy. melting		18.00
No. 1 bundles		16.00
No. 2 bundles		16.00
No. 3 bundles		13.00
Machine shop turn.		9.00
Elec. fur. 1 ft and under		28.00
No. 1 RR. hvy. melting		20.00
Scrap rails, random lgth.		20.00
No. 1 cupola cast.	$30.00 to	35.00

Los Angeles

No. 1 hvy. melting		$20.00
No. 2 hvy. melting		18.00
No. 1 bundles		16.00
No. 2 bundles		16.00
No. 3 bundles		13.00
Mach. shop turn.		9.00
Elec. fur. 1 ft and under		30.00
No. 1 RR. hvy. melting		20.00
No. 1 cupola cast.	$32.50 to	35.00

Seattle

No. 1 hvy. melting		$18.00
No. 2 hvy. melting		18.00
No. 1 bundles		16.00
No. 2 bundles		16.00
No. 3 bundles		12.00
Elec. fur. 1 ft and under	$25.00 to	28.00
RR. hvy. melting		19.00
No. 1 cupola cast.		30.00
Heavy breakable cast.		20.00

Hamilton, Ont.

No. 1 hvy. melting	$24.00
No. 1 bundles	16.00
No. 2 bundles	16.00
Mechanical bundles	22.00
Mixed steel scrap	20.00
Mixed bor. and turn.	18.00
Rails, remelting	24.00
Rails, rerolling	27.00
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Bush., new fact, unprep'd.	17.00
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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	Feb. 28, 1950	Feb. 21, 1950	Jan. 31, 1950	Mar. 1, 1949
Hot-rolled sheets	3.35	3.35	3.35	3.26
Cold-rolled sheets	4.10	4.10	4.10	4.00
Galvanized sheets (10 ga)	4.40	4.40	4.40	4.40
Hot-rolled strip	3.25	3.25	3.25	3.265
Cold-rolled strip	4.21	4.21	4.21	4.063
Plates	3.50	3.50	3.50	3.42
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	33.00	33.00	33.00	33.25
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes	$7.50	$7.50	$7.50	$7.75
Tinplate, electro (0.50 lb)	6.60	6.60	6.60	6.70
Special coated mfg. ternes	6.50	6.50	6.50	6.65
Bars and Shapes: (cents per pound)				
Merchant bars	3.45	3.45	3.45	3.37
Cold-finished bars	4.145	4.145	4.145	3.995
Alloy bars	3.95	3.95	3.95	3.75
Structural shapes	3.40	3.40	3.40	3.25
Stainless bars (No. 302)	28.50	28.50	28.50	28.50
Wrought iron bars	9.50	9.50	9.50	9.50
Wire: (cents per pound)				
Bright wire	4.50	4.50	4.50	4.194
Rails: (dollars per 100 lb)				
Heavy rails	$3.40	$3.40	$3.40	$3.20
Light rails	3.75	3.75	3.75	3.55
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$54.00	$54.00	$54.00	$52.00
Slabs, rerolling	54.00	54.00	54.00	52.00
Forging billets	63.00	63.00	63.00	61.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	63.00
Wire Rod and Skelp: (cents per pound)				
Wire rods	3.85	3.85	3.85	3.619
Skelp	3.15	3.15	3.15	3.25

Prices advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Pig Iron: (per gross ton)	Feb. 28, 1950	Feb. 21, 1950	Jan. 31, 1950	Mar. 1, 1949
No. 2, foundry, Phila.	$50.42	$50.42	$50.42	$51.56
No. 2, Valley furnace	46.50	46.50	46.50	46.50
No. 2, Southern Cin'ti	49.08	49.08	47.08	49.46
No. 2, Birmingham	42.38	42.38	40.38	43.38
No. 2, foundry, Chicago†	46.50	46.50	46.50	46.50
Basic del'd Philadelphia	49.92	49.92	49.92	50.76
Basic, Valley furnace	46.00	46.00	46.00	46.00
Malleable, Chicago†	46.50	46.50	46.50	46.50
Malleable, Valley	46.50	46.50	46.50	46.50
Charcoal, Chicago	68.56	68.56	68.56	73.78
Ferromanganese‡	173.40	173.40	173.40	163.80

†The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡Average of U. S. prices quoted on Ferroalloy page.

Scrap: (per gross tons)				
Heavy melt'g steel, P'gh.	*$30.75*	$31.75	$30.75	$38.75
Heavy melt'g steel, Phila.	23.00	23.00	23.00	38.50
Heavy melt'g steel, Ch'go	27.50	27.50	27.50	34.50
No. 1 hy. com. sh't, Det.	22.50	22.50	23.50	34.00
Low phos. Young'n	32.75	32.75	31.75	43.50
No. 1, cast, Pittsburgh	37.50	37.50	37.50	49.00
No. 1, cast, Philadelphia	35.50	35.50	37.00	44.00
No. 1, cast, Chicago	39.50	39.50	38.50	43.50
Coke: Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.00	$14.00	$14.00	$15.25
Foundry coke, prompt	15.75	15.75	15.75	16.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	18.50	18.50	18.50	23.50
Copper, Lake Conn.	18.625	18.625	18.625	23.625
Tin Straits, New York	74.50	74.50	74.50	$1.03
Zinc, East St. Louis	9.75	9.75	9.75	17.50
Lead, St. Louis	11.80	11.80	11.80	21.30
Aluminum, virgin	17.00	17.00	17.00	17.00
Nickel electrolytic	42.97	42.97	42.97	42.93
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	27.25	27.25	28.75	38.50

Composite Prices

Starting with the issue of May 12, 1940, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1940, issue.)

	Finished Steel Base Price	Pig Iron	Scrap Steel
Feb. 28, 1950	3.837¢ per lb.	$46.38 per gross ton	*$27.08* per gross ton
One week ago	3.837¢ per lb.	46.38 per gross ton	27.42 per gross ton
One month ago	3.837¢ per lb.	46.05 per gross ton	27.08 per gross ton
One year ago	3.754¢ per lb.	46.74 per gross ton	37.25 per gross ton

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Scrap Steel High	Scrap Steel Low
1950	3.837¢ Jan. 3	3.837¢ Jan. 3	$46.38 Feb. 7	$45.88 Jan. 3	$27.25 Feb. 7	$26.25 Jan. 3
1949	3.837¢ Dec. 27	3.705¢ May 3	46.87 Jan. 18	45.88 Sept. 6	43.00 Jan. 4	19.33 June 28
1948	3.721¢ July 27	3.193¢ Jan. 1	46.91 Oct. 12	39.58 Jan. 6	43.16 July 27	39.75 Mar. 9
1947	3.193¢ July 29	2.848¢ Jan. 1	37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 20
1946	2.848¢ Dec. 31	2.464¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
1945	2.464¢ May 29	2.396¢ Jan. 1	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944	2.396¢	2.396¢	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.396¢	2.396¢	23.61	23.61	$19.17	$19.17
1942	2.396¢	2.396¢	23.61	23.61	19.17	19.17
1941	2.396¢	2.396¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1932	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

UNIVERSITY OF MICHIGAN LIBRARIES

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Since 1898—for over fifty years—Alter Co. has served the scrap consumer as well as the scrap producing industry and scrap dealer.

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Sheet Iron for Baling
Stainless Steel
Non-Ferrous Metals

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COMPANY

1700 ROCKINGHAM ROAD DAVENPORT 2, IOWA

IRON AGE

STEEL PRICES

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.
Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

	Pittsburgh	Chicago	Gary	Cleveland	Canton Massillon	Middletown	Youngstown	Bethlehem	Buffalo	Conshohocken	Johnstown	Sparrows Point	Granite City	Detroit
INGOTS Carbon forging, net ton	$50.00 1													$50.00 31
Alloy, net ton	$51.00 1.17													$51.00 31
BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton	$53.00 1	$53.00 1	$53.00 1				$57.00 13		$53.00 3	$58.00 26	$53.00 3			
Carbon forging billets, net ton	$63.00 1	$63.00 1.4	$63.00 1.8	$63.00 4			$63.00 25		$63.00 3.4	$65.00 26	$63.00 3			$63.00 31
Alloy, net ton	$66.00 1.17	$66.00 1.4	$66.00 1		$66.00 4.42		$66.00 13	$66.00 3	$66.00 3.4	$68.00 26	$66.00 3			$66.00 31
SHEET BARS							$57.00 13							
PIPE SKELP	3.15 1						3.15 1.4							
WIRE RODS	3.85 2.18	3.85 2.4.33	3.85 6	3.85 2			3.85 6				3.85 3	3.95 3		
SHEETS Hot-rolled (18 ga. & hvr.)	3.35 1.5.9.15	3.35 23	3.35 1.6.8	3.35 4.5			3.35 1.4.6.13		3.35 3	3.45 26		3.35 3		3.55 12
Cold-rolled	4.10 1.5 7.9.15.63		4.10 1.6.8	4.10 4.15		4.10 7	4.10 4.6		4.10 3			4.10 3	4.30 22	4.30 12
Galvanized (10 gage)	4.40 1.9.15		4.40 1.8		4.40 4		4.65 64 4.75 44					4.40 3		
Enameling (12 gage)	4.40 1		4.40 1.8	4.40 4		4.40 7	4.40 6 4.90 76						4.60 22	4.70 12
Long ternes (10 gage)	4.80 9.15		4.80 1			4.80 7	4.80 64							
Hi Str. low alloy, h.r.	5.05 1.5.9	5.05 1	5.05 1.6.8	5.05 4.5			5.05 1.4.6.13		5.05 3	5.05 26		5.05 3		5.25 12
Hi Str. low alloy, c.r.	6.20 1.5.9		6.20 1.6.8	6.20 4.5			6.20 4.6.13		6.20 3			6.20 3		6.40 12
Hi Str. low alloy, galv.	6.75 1											6.75 3		
STRIP Hot-rolled (over 6 in.)	3.25 5.7.9.28	3.25 3.66	3.25 1.6.8	3.25 5			3.25 1.4.6.13		3.25 3	3.35 26		3.25 3		3.45 12.47
Cold-rolled	4.15 5.7.9.63	4.30 8.66	4.30 8	4.15 2.5		4.15 7	4.15 4.6.13.40.48.49		4.15 3			4.15 3		4.40 68-81 4.35 12-47
Hi Str. low alloy, h.r.	4.95 9		4.95 1.6.8	4.95 5			4.95 1.4.6.13		4.95 3	4.95 26		4.95 3		5.15 12
Hi Str. low alloy, c.r.	6.20 9			6.20 2.5			6.20 4.6.13		6.20 3			6.20 3		6.40 12
TINPLATE† Cokes, 1.50-lb base box 1.25 lb, deduct 20¢	$7.50 1.5.9.15		$7.50 1.6.8				$7.50 4					$7.60 3	$7.70 22	
Electrolytic 0.25, 0.50, 0.75 lb box	Deduct $1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price													
BLACKPLATE, 29 gage Hollowware enameling	5.30 1.5.15		5.30 1.6				5.30 4					5.40 3	5.50 22	
BARS Carbon steel	3.45 1.5.9.17	3.45 1.4.23	3.45 1.6.8	3.45 4	3.45 4		3.45 1.4.6		3.45 3.4		3.45 3			3.65 12
Reinforcing‡	3.45 1.5	3.45 4	3.45 1.6.8	3.45 4			3.45 1.4.6		3.45 3.4		3.45 3	3.45 3		
Cold-finished	4.10 5 4.15 2.4 17.52.69.71	4.15 2 23.69.70	4.15 4.73.74	4.15 2.61	4.15 4.32.82		4.15 6.40.57		4.15 70					4.35 12 4.30 64
Alloy, hot-rolled	3.95 1.17	3.95 1.4.23	3.95 1.6.8		3.95 4		3.95 1.6.25	3.95 3	3.95 3.4		3.95 3			4.25 12
Alloy, cold-drawn	4.90 2.17.52.69.71	4.90 2.23.69.70	4.90 4.73.74	4.90 2.61	4.90 4.42.82		4.90 6.25.57	4.90 3	4.90 3.70					5.05 64
Hi Str. low alloy, h.r.	5.20 1.5		5.20 1.6.8	5.20 4			5.20 1.6	5.20 3	5.20 3		5.20 3			5.40 12
PLATE Carbon Steel	3.50 1.5	3.50 1	3.50 1.6.8	3.50 4			3.50 1.13		3.50 3	3.60 26	3.50 3	3.50 3		3.75 12
Floor plates	4.55 1	4.55 1	4.55 3	4.55 5						4.55 26				
Alloy	4.40 1	4.40 1	4.40 1				4.40 13			4.40 26	4.40 3	4.40 3		
Hi Str. low alloy	5.35 1.5	5.35 1	5.35 1.3	5.35 4.5			5.35 6			5.35 26	5.35 3	5.35 3		5.60 12
SHAPES, Structural	3.40 1.5.9	3.40 1.23	3.40 1.6.8					3.45 3	3.45 3		3.45 3			
Hi Str. low alloy	5.15 1.5	5.15 1	5.15 1.6.8				5.15 6	5.15 3	5.15 3		5.15 3			
MANUFACTURERS' WIRE Bright	4.50 2.5.18	4.50 2 4.12.33.34		4.50 2.77			4.50 6	Kokomo = 4.60 30			4.50 3	4.60 3	Duluth = 4.50 2 Pueblo = 4.75 14	
PILING, Steel sheet	4.20 1.9	4.20 1							4.20 3					

UNIVERSITY OF MICHIGAN LIBRARIES

STEEL PRICES

Smaller numbers indicate producing companies. See key at right. Prices are in cents per lb unless otherwise noted. Extras apply.

Kansas City	Houston	Birmingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana		
					INGOTS Carbon forging, net ton
	$59.00 83				Alloy, net ton
		$53.00 11	F=$72.00[19]		BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton
	$71.00 83	$63.00 11	F=$82.00[19]	Geneva=$61.00[16]	Carbon forging billets, net ton
	$74.00 83		F=$85.00[19]		Alloy, net ton
				Portsmouth=$55.00[20]	SHEET BARS
					PIPE SKELP
	4.25 83	3.85 11	SF=4.50[24] LA=4.65[24,62]	Portsmouth=3.85[20] Worcester=4.15[2]	WIRE RODS
		3.35 4.11	SF, LA=4.05[24] F=4.25[19]	Ashland[7]=3.35 Niles=3.50[64]	SHEETS Hot-rolled (18 ga. & hvr.)
		4.10 11	SF=5.05[24] F=5.00[19]		Cold-rolled
		4.40 4.11	SF, LA=5.15[24]	Ashland=4.40[7] Kokomo=4.50[30]	Galvanized (10 gage)
					Enameling (12 gage)
					Long ternes (10 gage)
		5.05 11	F=6.74[19]		Hi Str. low alloy, h.r.
			F=7.05[19]		Hi Str. low alloy, c.r.
					Hi Str. low alloy, galv.
3.85 83	3.65 83	3.25 11	SF, LA=4.00[24,62] F=4.40[19] S=4.25[62]	Ashland=3.25[7] Atlanta=3.40[65]	STRIP Hot-rolled
			F=5.40[19] LA=5.50[27]	New Haven=4.85[2,68]	Cold-rolled
		4.95 11	F=6.64[19]		Hi Str. low alloy, h.r.
			F=6.95[19]		Hi Str. low alloy, c.r.
		7.60 11	SF=8.25[24]		TINPLATE Cokes, 1.50-lb base box 1.25 lb, deduct 20¢
Deduct $1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price					Electrolytic 0.25, 0.50, 0.75 lb box
					BLACKPLATE, 29 gage Hollowware enameling
4.05 83	3.85 83	3.45 4.11	SF, LA=4.15[24] LA=4.15[62]	Atlanta=3.60[65]	BARS Carbon steel
4.05 83	3.85 83	3.45 4.11	SF, S=4.20[62] F=4.10[19]	Atlanta=3.60[65]	Reinforcing‡
				Putnam, Newark=4.55[69]	Cold-finished
4.55 83	4.35 83		LA=5.00[62] F=4.95[19]		Alloy, hot-rolled
				Newark,[69] Worcester[2]=5.20 Hartford=5.20[4]	Alloy, cold-drawn
		5.20	F=6.25[19]		Hi Str. low alloy, h.r.
	3.90 83	3.50 4.11	F=4.10[19] S=4.40[62] Geneva=3.50[16]	Claymont=3.60[29] Coatesville=3.60[21] Harrisburg=3.50[35]	PLATE Carbon steel
				Harrisburg=4.55[35]	Floor plates
			F=5.40[19]	Coatesville=4.50[21]	Alloy
		5.35 11	F=5.95[19]	Geneva=5.35[16]	Hi Str. low alloy
4.00 83	3.80 83	3.40 11	SF=3.95[62] LA=4.00[24,62]	Phoenixville=3.30[56] Geneva=3.40[16]	SHAPES, Structural
		5.15 11	F=4.00[19] S=4.05[62]	Fontana=5.75[19] Geneva=5.15[16]	Hi Str. low alloy
5.10 83	4.90 83	4.50 4.11	SF, LA=5.45[24,62]	Portsmouth=4.50[20] Worcester=4.80[2]	MANUFACTURERS' WIRE Bright

Notes: †Special coated mfg ternes, deduct $1.00 from 1.50-lb coke base box price. Can-making quality blackplate, 55 to 128-lb, deduct $1.90 from 1.50-lb coke base box. ‡Straight lengths only from producer to fabricator.

KEY TO STEEL PRODUCERS

With Principal Offices

1 Carnegie-Illinois Steel Corp., Pittsburgh
2 American Steel & Wire Co., Cleveland
3 Bethlehem Steel Co., Bethlehem
4 Republic Steel Corp., Cleveland
5 Jones & Laughlin Steel Corp., Pittsburgh
6 Youngstown Sheet & Tube Co., Youngstown
7 Armco Steel Corp., Middletown, Ohio
8 Inland Steel Co., Chicago
9 Weirton Steel Co., Weirton, W. Va.
10 National Tube Co., Pittsburgh
11 Tennessee Coal, Iron & R. R. Co., Birmingham
12 Great Lakes Steel Corp., Detroit
13 Sharon Steel Corp., Sharon, Pa.
14 Colorado Fuel & Iron Corp., Denver
15 Wheeling Steel Corp., Wheeling, W. Va.
16 Geneva Steel Co., Salt Lake City
17 Crucible Steel Co. of America, New York
18 Pittsburgh Steel Co., Pittsburgh
19 Kaiser Co., Inc., Oakland, Calif.
20 Portsmouth Steel Corp., Portsmouth, Ohio
21 Lukens Steel Co., Coatesville, Pa.
22 Granite City Steel Co., Granite City, Ill.
23 Wisconsin Steel Co., South Chicago, Ill.
24 Columbia Steel Co., San Francisco
25 Copperweld Steel Co., Glassport, Pa.
26 Alan Wood Steel Co., Conshohocken, Pa.
27 Calif. Cold Rolled Steel Corp., Los Angeles
28 Allegheny Ludlum Steel Corp., Pittsburgh
29 Worth Steel Co., Claymont, Del.
30 Continental Steel Corp., Kokomo, Ind.
31 Rotary Electric Steel Co., Detroit
32 Laclede Steel Co., St. Louis
33 Northwestern Steel & Wire Co., Sterling, Ill.
34 Keystone Steel & Wire Co., Peoria, Ill.
35 Central Iron & Steel Co., Harrisburg, Pa.
36 Carpenter Steel Co., Reading, Pa.
37 Eastern Stainless Steel Corp., Baltimore
38 Washington Steel Corp., Washington, Pa.
39 Jessop Steel Co., Washington, Pa.
40 Blair Strip Steel Co., New Castle, Pa.
41 Superior Steel Corp., Carnegie, Pa.
42 Timken Steel & Tube Div., Canton, Ohio
43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
44 Reeves Steel & Mfg. Co., Dover, Ohio
45 John A. Roebling's Sons Co., Trenton, N. J.
46 Simonds Saw & Steel Co., Fitchburg, Mass.
47 McLouth Steel Corp., Detroit
48 Cold Metal Products Co., Youngstown
49 Thomas Steel Co., Warren, Ohio
50 Wilson Steel & Wire Co., Chicago
51 Sweet's Steel Co., Williamsport, Pa.
52 Superior Drawn Steel Co., Monaca, Pa.
53 Tremont Nail Co., Wareham, Mass.
54 Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
55 Ingersoll Steel Div., Chicago
56 Phoenix Iron & Steel Co., Phoenixville, Pa.
57 Fitzsimmons Steel Co., Youngstown
58 Stanley Works, New Britain, Conn.
59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
60 American Cladmetals Co., Carnegie, Pa.
61 Cuyahoga Steel & Wire Co., Cleveland
62 Bethlehem Pacific Coast Steel Corp., San Francisco
63 Follansbee Steel Corp., Pittsburgh
64 Niles Rolling Mill Co., Niles, Ohio
65 Atlantic Steel Co., Atlanta
66 Acme Steel Co., Chicago
67 Joslyn Mfg. & Supply Co., Chicago
68 Detroit Steel Corp., Detroit
69 Wyckoff Steel Co., Pittsburgh
70 Bliss & Laughlin, Inc., Harvey, Ill.
71 Columbia Steel & Shafting Co., Pittsburgh
72 Cumberland Steel Co., Cumberland, Md.
73 La Salle Steel Co., Chicago
74 Monarch Steel Co., Inc., Indianapolis
75 Empire Steel Co., Mansfield, Ohio
76 Mahoning Valley Steel Co., Niles, Ohio
77 Oliver Iron & Steel Co., Pittsburgh
78 Pittsburgh Screw & Bolt Co., Pittsburgh
79 Standard Forgings Corp., Chicago
80 Driver Harris Co., Harrison, N. J.
81 Detroit Tube & Steel Div., Detroit
82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
83 Sheffield Steel Corp., Kansas City
84 Plymouth Steel Co., Detroit

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

	Base Column	Pittsburg, Calif.
Standard & coated nails*	106	125§
Woven wire fence†	116	139
Fence posts, carloads††	116	...
Single loop bale ties	113	137
Galvanized barbed wire**	126	146
Twisted barbless wire	126	146

* Pgh., Chi., Duluth; Worcester, 6 columns higher; Houston, 8 columns higher; Kansas City, 13 columns higher. † 15½ gage and heavier. ** On 80 rod spools, in carloads. ††Duluth, Joliet; Johnstown, 112.

	Base per 100 lb	Pittsburg, Calif.
Merch. wire, annealed‡	$5.35	$6.30
Merch. wire, galv.‡	5.60	6.55
Cut nails, carloads‡‡	6.75	...

‡ Add 30¢ at Worcester; 20¢ at Chicago; 10¢ at Sparrows Pt.
‡‡ Less 20¢ to jobbers.
§ Torrance, 126.

PRODUCING POINTS — *Standard, Coated or galvanized nails, woven wire fence, bale ties, and barbed wire:* Alabama City, Ala., 4; Atlanta, 65; Aliquippa, Pa. (except bale ties), 5; Bartonville, Ill. (except bale ties), 34; Chicago, 4; Donora, Pa., 2; Duluth, 2; Fairfield, Ala., 11; Johnstown, Pa. (except bale ties), 3; Joliet, Ill., 2; Kokomo, Ind., 30; Minnequa, Colo., 14; Monessen, Pa. (except bale ties), 18; Pittsburg, Calif., 24; Portsmouth, Ohio, 20; Rankin, Pa. (except bale ties), 2; Sparrows Point (except woven fence), 3; Sterling, Ill., 33; San Francisco (except nails and woven fence), 14; Torrance, Calif. (nails only), 24; Worcester (nails only), 2; Houston (except bale ties), 83; Kansas City, 83.

Fence posts: Duluth, 2; Johnstown, Pa., 3; Joliet, Ill., 2; Minnequa, Colo., 14; Moline, Ill., 4; Williamsport, Pa., 51.

Cut nails: Wheeling, W. Va., 15; Conshohocken, Pa., 26; Warehame, Mass., 53.

CLAD STEEL

Base prices, cents per pound, f.o.b. mill

Stainless-carbon	Plate	Sheet
No. 304, 20 pct, Coatesville, Pa. (21)	*26.50	
Washgtn, Pa. (39)	*26.50	
Claymont, Del. (29)	*26.50	
Conshohocken, Pa. (26)		*22.50
New Castle, Ind. (55)	*26.50	*24.00
Nickel-carbon 10 pct, Coatesville (26)	27.50	
Inconel-carbon 10 pct, Coatesville (21)	36.00	
Monel-carbon 10 pct, Coatesville (21)	29.00	
No. 302 Stainless-copper-stainless, Carnegie, Pa. (60)		75.00
Aluminized steel sheets, hot dip, Butler, Pa. (7)		7.75

* Includes annealing and pickling, or sandblasting.

ELECTRICAL SHEETS

22 gage, HR cut lengths, f.o.b. mill

	Cents per lb
Armature	†6.45
Electrical	††6.95
Motor	*7.95
Dynamo	8.75
Transformer 72	9.30
Transformer 65	9.85
Transformer 58	10.55
Transformer 52	11.35

PRODUCING POINTS—Beech bottom, W. Va., 18; Brackenridge, Pa., 28; Follansbee, W. Va., 63; Granite City, Ill., 22*, add 20¢; Indiana Harbor, Ind., 8†, deduct 0.25¢; Mansfield, Ohio, 75; Niles, Ohio, 64, 76; Vandergrift, Pa., 1†, deduct 0.25¢; Warren, Ohio, 4; Zanesville, Ohio, 7†, deduct 0.25¢.

Numbers after producing points correspond to steel producers. See key on Steel Price page.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago) Base discount

Machine and Carriage Bolts

	Pct Off List Less Case	C.
½ in. & smaller x 6 in. & shorter	27	38
9/16 & ⅝ in. x 6 in. & shorter	29	40
¾ in. & larger x 6 in. shorter	26	37
All diam., longer than 6 in.	22	34
Lag, all diam over 6 in. & longer	28	39
Lag, all diam x 6 in. & shorter	30	41
Plow bolts	40	—

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

	Pct Off List Reg	Hvy	Lt
½ in. and smaller	41	35	41
9/16 and ⅝ in.	36	30	36
¾ to 1½ in.	31	27	33
1⅝ in. and larger	21	17	..

In full case lots, 15 pct additional discount.

Stove Bolts

	Pct Off List
Packaged, steel, plain finish	63
Packaged, plated finish	50
Bulk, plain finish**	69*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.
**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Large Rivets

(½ in. and larger) Base per 100 lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa. $7.25

Small Rivets

(7/16 in. and smaller) Pct Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham 43

Cap and Set Screws

(In bulk)	Pct Off List
Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	50
¼ in. through ⅝ in. x 6 in. and shorter high C heat treated	54
Milled studs	28
Flat head cap screws, listed sizes	24
Fillister head cap, listed sizes	43
Set screws, sq head, cup point, 1 in., diam and smaller x 6 in. and shorter	59

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	4.15¢
0.41 to 0.60 carbon	5.95¢
0.61 to 0.80 carbon	6.55¢
0.81 to 1.05 carbon	8.50¢
1.06 to 1.35 carbon	10.80¢

Worcester, add 0.30¢.

LAKE SUPERIOR ORES

(51.50% Fe; natural content, delivered lower lake ports)

	Per gross ton
Old range, bessemer	$8.10
Old range, nonbessemer	7.95
Mesabi, bessemer	7.85
Mesabi, nonbessemer	7.70
High phosphorus	7.70

After Jan. 25, 1950, increases or decreases in Upper Lake rail freight, dock handling charges and taxes are for buyers' account.

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 quality, per 100 lb	$3.40
Joint bars, per 100 lb	4.40
Light rails, per 100 lb	3.75

	Base Price cents per lb
Track spikes†	5.60
Axles	5.35
Screw spikes	8.60
Tie plates	4.20
Tie plates, Pittsburgh, Torr., Calif.*	4.35
Track bolts, untreated	8.85
Track bolts, heat treated, to railroads	9.10

* Seattle, add 30¢.
† Kansas City, 5.85¢.

PRODUCING POINTS—*Standard rails:* Bessemer, Pa., 1; Ensley, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Minnequa, Colo., 14; Steelton, Pa., 3.

Light rails: All the above except Indiana Harbor and Steelton, plus Fairfield, Ala., 11; Johnstown, Pa., 3; Minnequa, Colo., 14.

Joint bars: Bessemer, Pa., 1; Fairfield, Ala., 11; Indiana Harbor, Ind., 8; Joliet, Ill., 1; Lackawanna, N. Y., 3; Steelton, Pa., 3; Minnequa, Colo., 14.

Track spikes: Fairfield, Ala., 11; Indiana Harbor, Ind., 6, 8; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 5; Chicago, 4; Struthers, Ohio, 6; Youngstown, 4.

Track bolts: Fairfield, Ala., 11; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 77, 78.

Axles: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 79; Johnstown, Pa., 3; McKees Rocks, Pa., 1.

Tie plates: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Pittsburg, Calif., 24; Pittsburgh, 4; Seattle, 62; Steelton, Pa., 3; Torrance, Calif., 24; Minnequa, Colo., 14.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.00
18	4	1	—	5	$1.565
18	4	2	—	—	$1.13
1.5	4	1.5	8	—	71.5¢
6	4	2	6	—	76.5¢

High-carbon-chromium	57.5¢
Oil hardened manganese	32¢
Special carbon	29.5¢
Extra carbon	24.5¢
Regular carbon	21¢

Warehouse prices on and east of Mississippi are 2½¢ per lb higher. West of Mississippi, 4½¢ higher.

COKE

	Net Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$13.50 to $14.50
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$15.50 to $16.00
Foundry, oven coke	
Buffalo, del'd	$20.90
Chicago, f.o.b.	21.00
Detroit, f.o.b.	20.40
New England, del'd	22.70
Seaboard, N. J., f.o.b.	22.00
Philadelphia, f.o.b.	20.45
Swedeland, Pa., f.o.b.	20.40
Painesville, Ohio, f.o.b.	21.90
Erie, del'd	$21.04 to 21.25
Cleveland, del'd	22.63
Cincinnati, del'd	22.73
St. Paul, f.o.b.	23.50
St. Louis, del'd	21.60
Birmingham, del'd	19.75

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill. Base price, per ton net: Effective CaF, content:

70% or more	$37.00
60% or less	34.00

STAINLESS STEELS

Base prices, in cents per pound, f.o.b. producing point

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	12.75	13.50	15.00	14.50	22.75	18.25	20.00	11.25	13.75	11.50
Slabs, billets, rerolling	17.00	18.25	20.25	19.25	30.25	24.50	26.75	15.00	18.50	15.25
Forg. discs, die blocks, rings	30.50	30.50	33.00	32.00	49.00	36.50	41.00	24.50	25.00	25.00
Billets, forging	24.25	24.25	26.25	25.50	39.00	29.00	32.75	19.50	20.00	20.00
Bars, wire, structurals	28.50	28.50	31.00	30.00	46.00	34.00	38.50	23.00	23.50	23.50
Plates	32.00	32.00	34.00	34.00	50.50	39.50	44.00	26.00	26.50-27.00	26.50
Sheets	37.50	37.50	39.50	39.50	53.00	45.50	50.00	33.00	33.50	35.50
Strip, hot-rolled	24.25	25.75	30.00	27.75	46.00	34.50	38.75	21.25	28.00	21.75
Strip, cold-rolled	30.50	33.00	36.50	35.00	55.00	44.50	48.50	27.00	33.50	27.50

Numbers correspond to producers. See Key on Steel Price Page.

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38, 39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Lockport, N. Y., 46.

Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38; W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 80; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, 13; Butler, Pa., 7.

Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1, 67; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42.

Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Chicago, 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28.

Structurals: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44.

Plates: Brackenridge, Pa., 28; Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forged discs, die blocks, rings: Pittsburgh, 1, 17; Syracuse, 17; Ferndale, Mich., 28.

Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1.

REFRACTORIES (*F.o.b. works*)

Fire Clay Brick *Carloads, Per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5) $86.00
No. 1 Ohio 80.00
Sec. quality, Pa., Md., Ky., Mo., Ill. 80.00
No. 2 Ohio 72.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50) 14.00

Silica Brick

Mt. Union, Pa., Ensley, Ala. $86.00
Childs, Pa. 90.00
Hays, Pa. 91.00
Chicago District 95.00
Western, Utah and Calif. 101.00
Super Duty, Hays, Pa., Athens, Tex., Chicago 106.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.) 15.00
Silica cement, net ton, bulk, Hays, Pa. 17.00
Silica cement, net ton, bulk, Ensley, Ala. 16.00
Silica cement, net ton, bulk, Chicago District 16.00
Silica cement, net ton, bulk, Utah and Calif. 22.50

Chrome Brick *Per Net Ton*

Standard chemically bonded, balt., Chester $69.00

Magnesite Brick

Standard, Baltimore $91.00
Chemically bonded, Baltimore 80.00

Grain Magnesite *St. ⅝-in. grains*

Domestic, f.o.b. Baltimore, in bulk, fines removed ... $56.00 to $56.50
Domestic, f.o.b Chewelah, Wash., in bulk with fines ..... 30.50 to 31.00
in sacks with fines ..... 35.00 to 35.50

Dead Burned Dolomite

F.o.b producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢ ... $12.25

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags ... 7.4¢ to 9.0¢
Domestic sponge iron, 98+% Fe, carload lots ..... 9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+% Fe ..... 31.5¢ to 39.5¢
Electrolytic iron unannealed, minus 325 mesh, 99+% Fe ..... 48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+%Fe .. 63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micros, 98%, 99.8+% Fe 90.0¢ to $1.75
Aluminum ..... 29.00¢
Antimony ..... 42.53¢
Brass, 10 ton lots ..... 23.25¢ to 26.75¢
Copper, electrolytic ..... 28.625¢
Copper, reduced ..... 28.50¢
Cadmium $2.40
Chromium, electrolytic, 99% min. $3.50
Lead ..... 18.50¢
Manganese ..... 55.00¢
Molybdenum, 99% $2.65
Nickel, unannealed ..... 61.00¢
Nickel, spherical, minus 30 mesh, unannealed ..... 68.00¢
Silicon ..... 34.00¢
Solder powder ..... 8.5¢ plus metal cost
Stainless steel, 302 ..... 75.00
Tin ..... 86.50¢
Tungsten, 99% $2.90
Zinc, 10 ton lots ..... 15.50¢ to 18.25¢

ELECTRODES

Cents per lb. f.o.b. plant, threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb
	GRAPHITE	
17, 18, 20	60, 72	16.00¢
8 to 16	48, 60, 72	16.50¢
7	48, 60	17.75¢
6	48, 60	19.00¢
4, 5	40	19.50¢
3	40	20.50¢
2½	24, 30	21.00¢
2	24, 30	23.00¢
	CARBON	
40	100, 110	7.50¢
35	65, 110	7.50¢
30	65, 84, 110	7.50¢
24	72 to 104	7.50¢
17 to 20	84, 90	7.50¢
14	60, 72	8.00¢
10, 12	60	8.25¢
8	60	8.50¢

PIPE AND TUBING

Base discounts, f.o.b mills
Base price, about $200.00 per net ton

Standard, T & C

Steel, Buttweld*	*Black*	*Galv*
⅛-in.	40½ to 38½	24 to 22
¼-in.	43½ to 41½	28 to 26
1-in.	46 to 44	31 to 29
1¼-in	46½ to 44½	31½ to 29½
1½-in.	47 to 45	32 to 30
2-in.	47½ to 45½	32½ to 30½
2½ to 3-in.	48 to 46	33 to 31

Steel, lapweld			
2-in	37		23½ to 22½
2½ to 3-in.	41	to 40	25½ to 24½
3½ to 6-in.	44	to 40	28½ to 24½

Steel, seamless		
2-in.	36	20½
2½ to 3-in.	39	23½
3½ to 6-in.	41	25½

Wrought Iron, buttweld		
⅛-in.	+26½	+53
¼-in.	+16½	+42
1 & 1¼-in.	+10½	+33
1½-in.	+ 4½	+29½
2-in.	+ 4	+29

Wrought Iron, lapweld		
2-in.	+13½	+37
2½ to 3½-in.	+11	+32½
4-in.	+ 6	+26½
4½ to 8-in.	+ 8	+28
9 to 12-in.	+18	+37½

Extra Strong, Plain Ends

Steel, buttweld		
⅛-in.	39½ to 37½	24½ to 22½
¼-in.	43½ to 41½	28½ to 26½
1-in.	45½ to 43½	31½ to 29½
1¼-in.	46 to 44	32 to 30
1½-in.	46½ to 44½	32½ to 30½
2-in.	47 to 45	33 to 32
2½ to 3-in.	47½ to 45½	33½ to 31½

Steel, lapweld		
2-in.	37 to 36	22½ to 21½
3½ to 3-in.	42 to 40	27½ to 25½
3½ to 6-in.	45½ to 41½	41 to 29

Steel, seamless		
2-in.	35	20½
2½ to 3-in.	39	24½
3½ to 6-in.	42½	28

Wrought Iron, buttweld		
⅛-in.	+22	+47
¼-in.	+15½	+40
1 to 2-in.	+ 5½	+29

Wrought Iron, lapweld		
2-in.	+10½	+33½
2½ to 4-in.	+ 1	+22
4½ to 6-in.	+ 5	+26½
7 & 8-in.	list	+21½
9 to 12-in.	+11½	+29½

For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct. *Fontana, Calif., deduct 11 points from figures in left columns.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut lengths 10 to 24 ft inclusive.

OD in in.	gage BWG	Seamless H.R.	Seamless C.R.	Electric H.R.	Electric Weld C.D.
2	13	$20.61	$24.24	$19.99	$23.51
2½	12	27.71	32.58	26.88	31.60
3	12	30.82	36.27	29.90	35.18
3½	11	38.52	45.38	37.36	43.99
4	10	47.82	56.25	46.39	54.56

CAST IRON WATER PIPE

Per net ton

6 to 24-in., del'd Cicago ... $91.80 to $95.30
6 to 24-in., del'd N. Y. ..... 91.00 to 92.00
6 to 24-in., Birmingham ... 78.00 to 82.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less ..... $108.50 to $113.00

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb.
(Metropolitan area delivery, add 20c to base price except Birmingham, Cincinnati, Los Angeles, New Orleans and Philadelphia (*), add 15c).

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Baltimore	5.05	6.24-6.44[1]	6.46-6.46[2]	5.59-5.59[11]	....	5.20-5.64[11]	5.49	5.49-5.49[11]	6.19	....	10.05	....	....
Birmingham*	5.05[10]	5.80	6.15[7]	5.10[10]	....	5.20	5.05	5.00[10]	6.73	....	....	....	....
Boston	5.73	6.48[20]-6.85	6.79-7.24[21]	5.78	6.90-6.95	5.68	5.55	5.60	6.02-6.58	9.70-9.97	8.50-10.37	11.15	11.45
Buffalo	5.05	5.80	6.60	5.41	7.27	5.45	5.15	5.05	5.75	9.60	9.90	11.05	11.35
Chicago	5.05	5.80	6.70	5.10	5.45-6.16	5.20	5.05	5.00	5.65	9.25	9.55	10.70	11.00
Cincinnati*	5.32-5.97	5.80-6.24	6.29-6.39	5.49	....	5.59-5.74	5.44-5.59	5.39-5.54	6.10-6.25	9.60-9.81	9.90-10.11	11.05-11.26	11.35-11.56
Cleveland	5.05	5.80	6.95	5.24	6.35	5.32	5.17	5.12	5.75	9.36	9.66	10.81	11.11
Detroit	5.33	6.08	7.09	5.49	6.27-6.58	5.59	5.44	5.39	6.03	9.56	9.86	11.01	11.31
Houston	5.75	....	....	6.10	....	6.00	5.95	6.10	7.80	10.35-10.45	10.80-10.60	11.50	11.95-12.10
Indianapolis	....	....	....	....	7.38	....	....	....	....	....	....	....	....
Kansas City	5.65	6.40	7.30	5.70	6.95	5.80	5.65	5.60	6.35	9.85	10.15	11.30	11.60
Los Angeles*	5.80	7.00	7.45[3]	5.85	7.35-7.85[16]	5.80	5.70	5.80	7.55	10.05	10.20	11.70	12.10
Memphis	5.93	6.68	....	5.98	6.80	6.08	5.93	5.68	....	....	....	....	....
Milwaukee	5.19	5.94	6.84	5.24	6.32	5.34	....	5.14	5.89	9.39	9.69	10.84	11.14
New Orleans*	5.50[1]	6.85[1]	....	5.55[1]	6.90[1]	5.65	5.55[1]	5.55[1]	6.75	....	....	....	....
New York	5.55-5.65	6.54-6.64	6.90-7.00	5.84	6.76[3]	5.70	5.45	5.65	6.44	9.60	9.90	11.05	11.35
Norfolk	6.10	7.00	....	6.30	....	6.15	6.20	6.15	7.20	....	....	....	....
Omaha	....	....	....	....	....	....	....	....	....	....	....	....	....
Philadelphia*	5.30	6.20	6.70	5.65	6.29	5.45	5.25	5.50	6.31	9.35	9.65	10.80	11.10
Pittsburgh	5.05	5.80	6.70	5.20	6.00	5.20	5.05	5.00	5.75	9.25	9.55	10.70	11.00
Portland	6.60-7.10[1]	8.40[2]	8.20[2]	6.85[9]	....	....	6.50	6.45-6.45[9]	8.60[14]	12.00[18]	11.60[18]	....	....
Salt Lake City	5.85	6.70	8.75	7.45	6.75	6.10[3]	5.90	7.35[8]	8.75	....	....	....	....
San Francisco	6.25[11]	7.60[2]	7.50[2]	6.75[11]	8.25	6.15[11]	6.00	6.15[11]	7.80	....	....	....	....
Seattle	6.70[4]	8.15[2]	8.20[2]-8.35[2]	6.90[4]	....	.35[4]	6.25[4]	6.35[4]	8.50[14]	....	11.60[18]	....	13.60[18]
St. Louis	5.38	6.13	7.03	5.43	6.68-7.54	5.53	5.38	5.33-5.35	6.08	9.58	9.88	11.03	11.33
St. Paul	5.76	6.51	7.41	5.81	6.16-6.82	5.91	5.76	5.71	6.42	9.96	10.26	11.41	11.71

BASE QUANTITIES: (*Standard unless otherwise keyed on prices*).

Hot-rolled sheets and strip, hot rolled bars and bar shapes, structural shapes, plate, galvanized sheets and cold-rolled sheets: 2000 to 9999 lb. Cold-finished bars: 1000 lb or over. Alloy bars: 1000 to 1999 lb.

All HR products may be combined to determine quantity bracket. All galvanized sheets may be combined to determine quantity bracket. CR sheets may not be combined with each other or with galv. sheets to determine quantity bracket.

Exceptions:

(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 to 5999 lb; (6) 1000 lb and over; (7) 500 to 1499 lb; (8) 400 lb and over; (9) 400 to 9999 lb; (10) 500 to 9999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 9999 lb; (16) 6000 lb and over; (17) up to 1999 lb; (18) 1000 to 4999 lb; (19) 1500 to 3499 lb; (20) CR sheets may be combined for quantity; (21) 3 to 24 bundles.

PIG IRON PRICES

Dollars per gross ton. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES

Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	48.00	48.50	49.00	49.50	.....
Birmingham	41.88	42.38	.....	.....	.....
Buffalo	46.00	46.50	47.00	.....	.....
Chicago	46.00	46.50	46.50	47.00	.....
Cleveland	46.00	46.50	46.50	47.00	51.00
Duluth	46.00	46.50	46.50	47.00	.....
Erie	46.00	46.50	46.50	47.00	.....
Everett	.....	50.50	51.00	.....	.....
Granite City	47.90	48.40	48.90	.....	.....
Ironton, Utah	46.00	46.50	.....	.....	.....
Pittsburgh	46.00	46.50	46.50	47.00	.....
Geneva, Utah	46.00	46.50	.....	.....	.....
Sharpsville	46.00	46.50	46.50	47.00	.....
Steelton	48.00	48.50	49.00	49.50	54.00
Struthers, Ohio	46.00	.....	.....	.....	.....
Swedeland	48.00	48.50	49.00	49.50	.....
Toledo	46.00	46.50	46.50	47.00	.....
Troy, N. Y.	48.00	48.50	49.00	.....	54.00
Youngstown	46.00	46.50	46.50	47.00	.....

DELIVERED PRICES (BASE GRADES)

Consuming Point	Producing Point	Rail Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$0.50 Arb.	.....	50.50	51.00	.....	.....
Boston	Steelton	6.90	.....	.....	.....	.....	60.90
Brooklyn	Bethlehem	4.29	.....	52.79	53.29	53.79	.....
Cincinnati	Birmingham	6.70	48.58	49.08	.....	.....	.....
Jersey City	Bethlehem	2.63	.....	51.13	51.63	52.13	.....
Los Angeles	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Mansfield	Cleveland-Toledo	3.33	49.33	49.83	49.83	50.33	54.33
Philadelphia	Bethlehem	2.39	50.39	50.89	51.39	51.89	.....
Philadelphia	Swedeland	1.44	49.44	49.94	50.44	50.94	.....
Philadelphia	Steelton	3.09	.....	.....	.....	.....	57.09
Rochester	Buffalo	2.63	48.63	49.13	49.63	.....	.....
San Francisco	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Seattle	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
St. Louis	Granite City	0.75 Arb.	48.65	49.15	49.65	.....	.....
Syracuse	Buffalo	3.58	49.58	50.08	50.58	.....	.....

Producing point prices are subject to switching charges; silicon differential (not to exceed 50c per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differentials, a reduction of 38c per ton for phosphorus content of 0.70 pct and over manganese differentials, a charge not to exceed 50c per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.01 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—$57.00; f.o.b. Buffalo, $58.25. Add $1.00 per ton for each additional 0.50 pct Si up to 17 pct. Add 50c per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus $60.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, $68.56. High phosphorus charcoal pig iron is not being produced.

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FERROALLOYS

Ferromanganese

78-82% Mn. maximum contact base price, gross ton, lump size.

F.o.b. Birmingham	$174
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont.	$172
F.o.b. Johnstown, Pa.	$174
F.o.b. Sheridan, Pa.	$172
F.o.b. Etna, Clairton, Pa.	$175

$2.00 for each 1% above 82% Mn, penalty, $2.15 for each 1% below 78%.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	10.45
Ton lots	12.05
Less ton lots	12.95

Spiegeleisen

Contract prices gross ton, lump, f.o.b

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$64.00	$65.00
Pgh. or Chicago	65.00	66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, packed	35.5
Ton lots	37.0

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	28
Ton lots	30
Less ton lots	32

Low-Carbon Manganese

Contract price, cents per pound Mn contained, lump size, delivered.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	25.25	27.10	28.30
0.10% max. C	24.75	26.60	27.80
0.15% max. C	24.25	26.10	27.30
0.30% max. C	23.75	25.60	26.80
0.50% max. C	23.25	25.10	26.30
0.75% max. C, 7.00% max. Si	20.25	22.10	23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.

Carload bulk	8.95
Ton lots	10.60
Briquet, contract basis carlots, bulk delivered, per lb of briquet	10.30
Ton lots	11.90
Less ton lots	12.80

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $77.00 gross ton, freight allowed to normal trade area; Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $73.50. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	20.70
97% Si, 1% Fe	21.10

Silicon Briquets

Contract price, cents per pound of briquet, bulk, delivered, 40% Si, 1 lb Si briquets.

Carload, bulk	6.30
Ton lots	7.90
Less ton lots	8.80

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size, bulk, in carloads, delivered.

25% Si	17.00
50% Si	11.30
75% Si	13.50
85% Si	14.65
90-95% Si	16.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max. Si)

0.06% C	28.75
0.10% C	28.25
0.15% C	28.00
0.20% C	27.75
0.50% C	27.50
1.00% C	27.25
2.00% C	27.00
65-69% Cr, 4-9% C	20.50
62-66% Cr, 4-6% C, 6-9% Si	21.35

Briquets — Contract price, cents per pound of briquet, delivered ,60% chromium.

Carload bulk	13.75
Ton lots	15.25
Less ton lots	16.15

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	21.60
Ton lots	23.75
Less ton lots	25.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, per lb chromium contained packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.

0.20% max. C	$1.09
0.50% max. C	1.05
9.00 min. C	1.04

Calcium-Silicon

Contract price per lb of alloy, lump, delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CMSZ

Contract price, cents per pound of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	19.75
Less ton lots	21.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	15.75¢
Less ton lots	17.00¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	17.00¢
Ton lots to carload packed	18.00¢
Less ton lots	19.50¢

SMZ

Contract price, cents per pound of alloy, delivered. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.25
Less ton lots	18.50

Other Ferroalloys

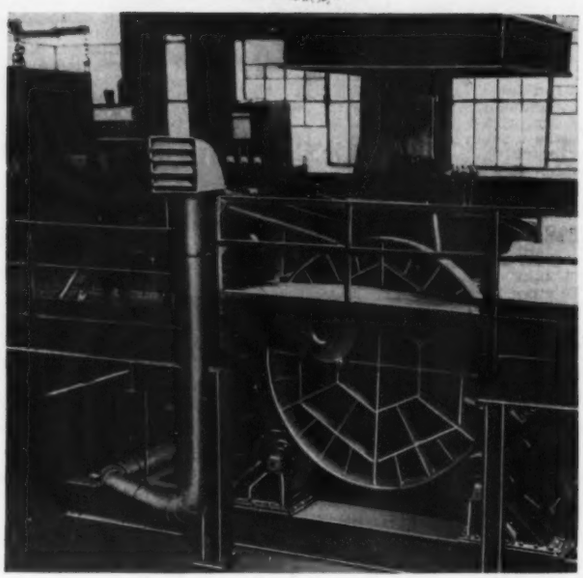
Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	7.65¢
Ton lots	9.05¢
Calcium molybdate, 45-40%, f.o.b. Langeloth, Pa., per pound contained Mo.	96¢
Ferrocolumbium, 50-60% contract basis, delivered, per pound contained Cb.	
Ton lots	$2.90
Less ton lots	2.95
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo.	$1.13
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton	$65.00
10 tons to less carload	75.00
Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti	$1.28
Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti	$1.40
Less ton lots	1.45
Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, carloads per net ton	$160.00
Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered	$2.25
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.	
Openhearth	$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa.	95¢
bags, f.o.b. Washington, Pa., Langeloth, Pa.	94¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk, lump	11.00¢
Ton lots, bulk, lump	11.50¢
Ton lots, packed, lump	11.75¢
Less ton lots, lump	12.25¢
Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound contained V_2O_5	$1.20
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.	
Carload, bulk	6.60¢

Boron Agents

Contract prices, per lb of alloy, del.

Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B	$4.25
Bortam, f.ob. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, f.o.b. Suspension Bridge, N. Y.; freight allowed. Ti 15-18%, B 1.00-1.50%, Si 2.5-3.0%, Al 1.0-2.0%.	
Ton lots, per pound	8.625¢
Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots	$1.20
F.o.b. Wash., Pa.; 100 lb and over	
10 to 14% B.	.75
14 to 19% B.	1.20
19% min. B.	1.50
Grainal, f.o.b. Bridgeville, Pa. freight allowed, 100 lb and over.	
No. 1	93¢
No. 6	63¢
No. 79	45¢
Manganese—Boron 75.00% Mn. 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C. 2 in. x D, delivered.	
Ton lots	$1.67
Less ton lots	1.79
Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	
Less ton lots	$1.80
Silcaz, contract basis, delivered	
Ton lots	45.00¢

Scovill installs WORLD'S LARGEST AJAX - SCOMET Electric Induction Furnace



One of the three 1000 KW. Ajax-Scomet Electric Induction Furnaces, for melting brass, recently installed at Waterbury, Connecticut, for the Scovill Manufacturing Company.

For faster melting, lower melting losses, close temperature control, and complete dependability in quality results, Scovill Manufacturing Company chose the 1000 KW. Ajax-Scomet Electric Induction Furnace for its new plant. It is the largest and most powerful electric melting furnace ever made for brass.

Holding capacity is 20,000 pounds, with an hourly melting rate of 5½ to 6 tons. Under controlled conditions, molten metal is supplied to continuous casting machines for the production of brass strip of unprecedented size.

Ajax engineers bring you over thirty years' experience in the induction melting field. Ajax-Scomet Electric Induction Furnaces offer distinct advantages in cost reduction and manufacturing efficiency.

AJAX ENGINEERING CORPORATION • Trenton 7, New Jersey

AJAX TAMA-WYATT INDUCTION MELTING FURNACE

Associate Companies: AJAX METAL COMPANY, Non-Ferrous Ingot Metals and Alloys for Foundry Use
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AJAX ELECTRIC FURNACE CORP., Ajax-Wyatt Induction Furnaces for Melting

Coal Crisis Hurts Fabricators

Continued from Page 123

still taking its allotment of steel and warehousing it, and most of its suppliers are taking all their steel too.

Last week bars were placed on allocation by a major producer. Others have been allocating them for some time. Inventories of hot rolled and cold drawn bars are low in warehouses as well as in industrial plants. At least one user of bar shapes had to cut his production last week when Inland reduced his allocation. Warehouse stocks of alloy bars are fairly good, but demand for alloys has been strengthening lately and stocks will go fast if and when substitution becomes prevalent.

Inventory levels vary among users of plates and structurals. In general, these items have not been so hard to get and business has not been so good that these users haven't had a chance to build up good inventories. However, all of them used the opportunity. Many have been pessimistic about the business outlook, and for that reason have kept inventories low. They are feeling the pinch right now.

Founders Don't Expect Trouble

Among the branches of industry here which are comparatively well off as far as steel is concerned are forge shops, foundries and can makers. The big can makers have inventories good for from two to eight weeks, while foundries and forge shops generally don't expect to be in erouble unless the coal strike lasts well into March.

Steam coal is running low. Few industrial plants use coal now, but among those that do, layoffs are expected to start next week. Harvester and Pullman-Standard are among those who have announced that curtailment of operations will be necessary soon.

The first signs of industry slowdown were observed here last week. Most industrial observers think industry will be at a virtual standstill in three to four weeks.

Resume your reading on page 123

UNIVERSITY OF MICHIGAN LIBRARIES

Iron Age *Introduces*

Continued from Page 23

F. H. THOLEN, assistant general sales manager, J. B. Ford division of Wyandotte Chemicals Corp.

F. H. Tholen was promoted to assistant general sales manager of the J. B. Ford division of WYANDOTTE CHEMICALS CORP., Wyandotte, Mich. He was recently manager of the department handling the sale of bulk products in small size through Wyandotte Chemicals distributors.

J. F. Black joined the YOUNGSTOWN SHEET & TUBE CO. as assistant general superintendent of the steel plant at Indiana Harbor Works. Since 1947 he had been plant manager of the Wickwire plant of COLORADO FUEL & IRON CORP., Buffalo.

William F. Ryan was elected vice president of the STONE & WEBSTER ENGINEERING CORP., Boston. As engineering manager, he will continue to be responsible for the activities of the engineering department with his headquarters in the Boston office.

K. R. Knoblauch has been named manager of sales of valve products for the industrial division of MINNEAPOLIS-HONEYWELL REGULATOR CO. He will continue to make his headquarters at the Brown Instruments division plant.

F. W. Beichley has been made Pacific Coast district engineering supervisor for the WESTINGHOUSE ELECTRIC CORP. with headquarters in San Francisco. He was formerly transportation engineering supervisor at San Francisco.

Turn to Page 150

WHEELABRATOR® saves $9525 A YEAR

AIRLESS BLAST CLEANING

at the MAJESTIC CO. Huntington, Indiana

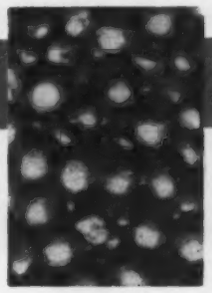
	FORMER METHOD	WHEELABRATOR METHOD
MACHINE	8 tumbling mills	66" Wheelabrator Swing Table
PRODUCTION	125 tons per month	125 tons per month
LABOR	2 men at 9 hours each 18 man hours daily	1 man at 8 hours — 8 man hours daily
CLEANING COST	Per Ton — $13.29	Per Ton — $6.94

SAVINGS per ton $6.35 per month $793.75 per year $9525.00

Gray iron castings ranging in weight from a few ounces up to 400 pounds are cleaned in Majestic's foundry.

Since the Wheelabrator Swing Table was installed the bulk of their production changed from large, heavy furnace work to thousands of small, relatively fragile pieces. According to Mr. Claude Morgan, Plant Supt., it would have been impossible to operate the foundry profitably without the Wheelabrator Swing Table—breakage would have been prohibitive and labor costs excessive.

Costs go down—profits go up, when you use Wheelabrator. Write today for full information.



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TRU-STEEL shot lasts longer

By replacing Chilled Iron Shot with TRU-STEEL an Ohio plant saved 62% on the cost of shot and machine parts. TRU-STEEL shot lasts many times longer than chilled iron because it wears down slowly without breaking down.

A test will show you how much you can save. Write today for descriptive Bulletin No. 59.

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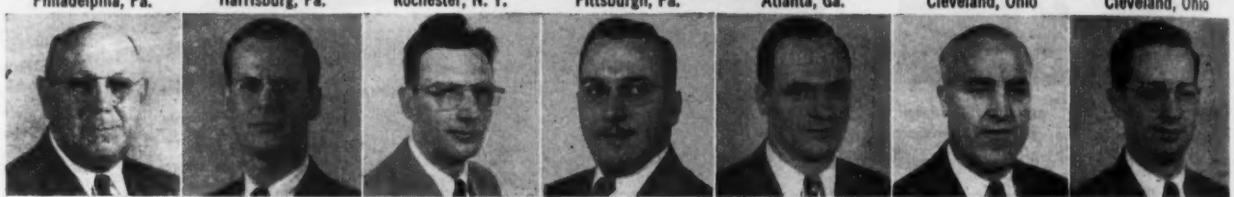

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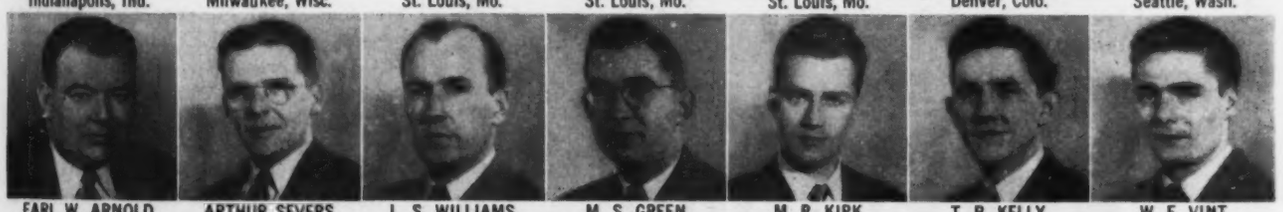

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Delicate fabrication or massive work, Kester makes a specialized flux-core solder (over 100,000 different types and sizes) that will do the job perfectly. Kester Solders are made only from newly mined grade A tin and virgin lead.

Preferred

Kester Flux-Core Solders are not only preferred by industry, but individual workers also insist upon Kester to enable them to do their best work with a minimum of rejects.

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Standard for Industry since 1899

IRON AGE INTRODUCES

Continued from Page 147

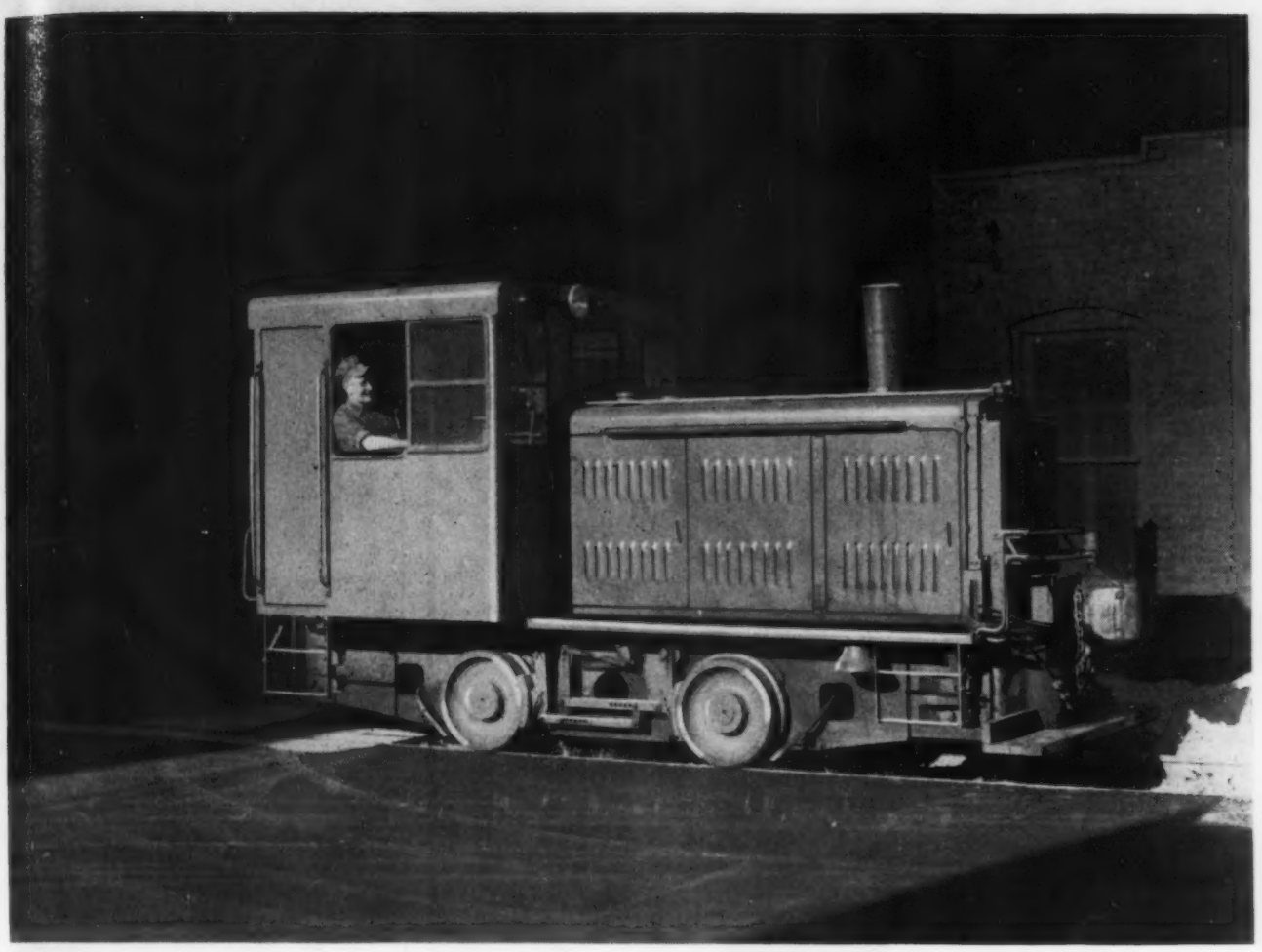
DR. WILLIAM G. THEISINGER, regional manager of sales, Lukens Steel Co.

Dr. William G. Theisinger has been named regional manager of sales for LUKENS STEEL CO., with headquarters in Houston, Texas. Dr. Theisinger has been manager of technical sales for the past four years. In his new position, he will supervise the activities of district sales offices and sales representatives in 12 southern states, from South Carolina to California.

Hiram B. Young, formerly superintendent of the Niagara Falls plant of the HOOKER ELECTROCHEMICAL CO., was recently appointed works manager. **Frank W. Dennis,** formerly personnel director and employment manager, was named director of industrial relations for plants at Niagara Falls, Tacoma, Wash., and subsidiary Hooker-Detrex plants at Tacoma, Wash., and Ashtabula, Ohio. **Leonard F. Bryant,** formerly assistant production superintendent is now plant superintendent and **Walton B. Scott,** formerly assistant technical superintendent is now technical superintendent.

George A. Dauphinais was assigned works manager of the QUAKER RUBBER CORP., Philadelphia, a newly acquired division of H. K. PORTER CO., Pittsburgh.

R. B. Church, Jr., was appointed assistant to the district manager of WESTINGHOUSE ELECTRIC CORP.'s southeastern district. **B. M. Gatling, Jr.,** becomes central station division manager. Both men will be located in Atlanta.



"Day after day — week after week — our PLYMOUTH is right there on the job!"

"We get the kind of performance that pays off," says E. Robert Philips, Vice-President of Philips and Davies, Inc., Kenton, Ohio. "In two years of general plant hauling, this efficient gasoline-powered locomotive has been in the shop for maintenance just about four days. We couldn't get along without our Plymouth Locomotive!"

Husky, powerful PLYMOUTH LOCOMOTIVES are engineered and built to take the high cost out of hauling all classes of loads . . . over the roughest runs on standard or narrow gauge rails. 2½-ton to 70-ton gasoline, diesel, and diesel-electric models are proving the profitable advantages of PLYMOUTH fuel economy . . . rugged strength . . . long, dependable service in every type of industry.

There's a PLYMOUTH LOCOMOTIVE built to handle your hauling jobs economically! Write today for illustrated literature. Plymouth Locomotive Works, Dept. A-2, Plymouth, Ohio.

PLYMOUTH LOCOMOTIVES

GASOLINE, DIESEL, AND DIESEL ELECTRIC

PLYMOUTH LOCOMOTIVE WORKS • Division of The Fate-Root-Heath Co., Plymouth, Ohio, U.S.A.

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***SPEEDS* PRODUCTION**
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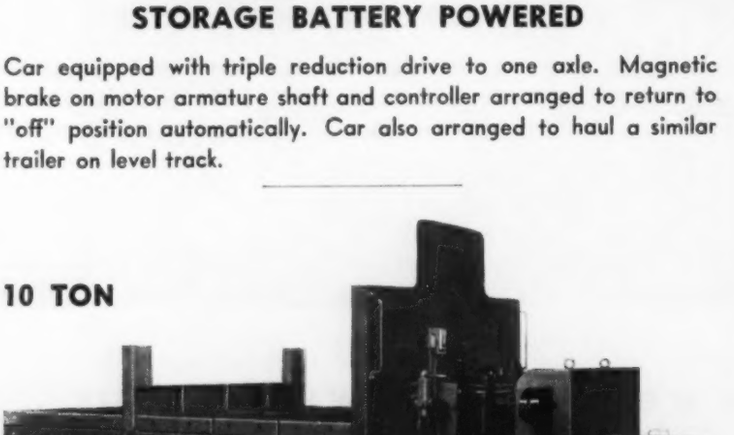

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STORAGE BATTERY POWERED

Car equipped with triple reduction drive to one axle. Magnetic brake on motor armature shaft and controller arranged to return to "off" position automatically. Car also arranged to haul a similar trailer on level track.

10 TON

CABLE-REEL LOCOMOTIVE

Car has 60 HP motor. Current applied through motor-driven cable reel. Spring mounted journals with roller bearings. Operator protected from hot materials by 3" of insulating between steel partition. Hydraulic brake equipment and standard safety features.

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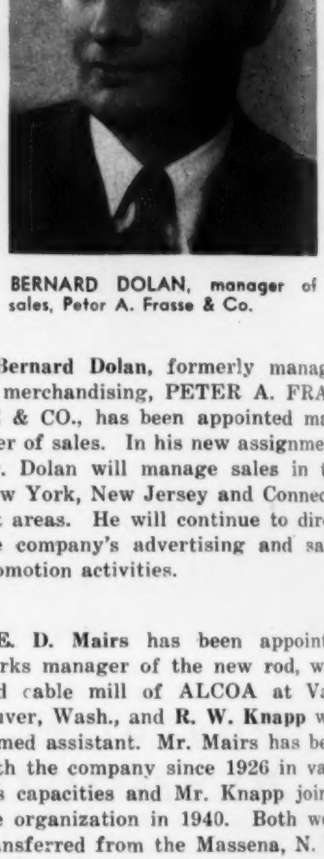


BERNARD DOLAN, manager of sales, Peter A. Frasse & Co.

Bernard Dolan, formerly manager of merchandising, PETER A. FRASSE & CO., has been appointed manager of sales. In his new assignment, Mr. Dolan will manage sales in the New York, New Jersey and Connecticut areas. He will continue to direct the company's advertising and sales promotion activities.

E. D. Mairs has been appointed works manager of the new rod, wire and cable mill of ALCOA at Vancouver, Wash., and **R. W. Knapp** was named assistant. Mr. Mairs has been with the company since 1926 in various capacities and Mr. Knapp joined the organization in 1940. Both were transferred from the Massena, N. Y., works. Other appointments at the new mill include: **Douglas Sharp,** industrial engineer; **Danforth Barney,** metallurgist; **Fred W. Paulsen,** mechanical engineer; **J. P. Lamoureux,** production planning; **Lee Steinbarge,** maintenance supervisor and **Otto F. Turner,** supervisory staff of fabricating division.

E. C. Thomas has recently assumed the duties of works manager at the SOUTHWEST STEEL ROLLING mills in Los Angeles. Mr. Thomas has been associated with the steel industry both in this country and Canada for many years.

Charles M. Kay was named division superintendent of steel works for the AMERICAN STEEL & WIRE CO., South Works, in Worcester. Mr. Kay succeeds to the office vacated by **U. F. Corsini.**

The HOUGHTON LINE NEWS

VOL. 18, NO. 1 MARCH, 1950

...the "near editor's" viewpoint...

Retirement of men at age 65 proved to be a controversial subject, many declaring it is a real social waste. One reason brought forward for today's longer span of life is that we have to live longer to earn enough to pay our taxes.

Since the pendulum swung back from state socialism to free enterprise in Australia, most Conservatives expect to see business improve almost overnight. But the dollar shortage cannot be overcome that rapidly, and that is the fundamental economic problem "down under."

And from Australia comes the item about an old grandfather who was given a new boomerang and spent the rest of his life trying to throw the old one away.

Aaron E. Carpenter

PRESIDENT.

Photo courtesy Baldwin Loco. Works

Applying Houghton's Cosmoline to exposed moving surfaces of engines to be shipped to India, to prevent corrosion during long ocean voyage. They arrived in perfect condition.

32-Year-Old Oil

We've always said that the only trouble with our treated quenching oil is that it lasts too long—no replacement needed. Here's proof: a New England plant which has used the same quenching oil for 32 years with only small make-up over those years. We checked it for them back in 1940 when new tanks were built and told them it was still O.K. to use, which they did, all thru war production. In 1948 water leaked into the tank and they had to discard the oil. Of course they bought Houghton oil again, because of its proven stability.

Here's a Punch Line

A concern punching lug holes in automobile wheels found it could step up punch life from 25,000 to 100,000 holes per punch —by changing to Antisep All-Purpose Base as the lubricant. Oil consumption was cut to 1/3 that of the former product.

Taking the Bars Down

When you tell a bar mill man he can draw without using lime, he's much interested. That's why the news about a better drawing compound which replaces dirty, hard-to-clean, slower lime, is attracting so much attention.

In one mill we have found over an eight months' period that bars can be drawn faster, with a single dip in a *Houghto-Draw 357* solution. Bars are pickled in a 10% H_2SO_4 solution containing Houghton's *Acitrol* pickling inhibitor. Rinsed, they are then immersed for 5 minutes in the Houghto-Draw solution (5 oz. per gal. of water at 170° F.) drained, dried and drawn. The film is very adherent and prevents rusting. It is readily removed in an alkaline cleaning bath.

Reduction of 1/16" is made on 1-7/16" bars of C-1118 steel, for example, in a single pass, using carbide insert dies. Based on tonnage of ¾" to 1¼" bars which have been drawn, consumption of Houghto-Draw 357 has been about ¾ of a pound per ton of bars processed.

The tank now needs no cleaning, heats up faster because steam lines are not encrusted. Work has brighter finish. Over-all cost is no higher than with lime. Speeds can be as much as 20 ft. per minute faster, with less frictional heat. Either water emulsions or straight oil may be used to cool the dies.

Houghto-Draw 357, a paste-type product containing waxes, fats and colloidal pigment, described in bulletin offered as Item "A" at the right, is one of the new line of proven die lubricants now being announced by Houghton. What is *your* drawing problem?

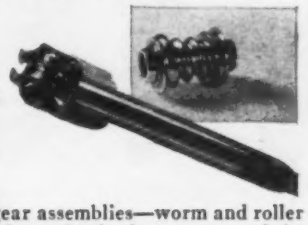
No Pitting Permitted

Commercial galvanizing shops will be interested in a report from Chicago on the success obtained by one shop using our *Acitrol* Liquid pickling inhibitor, together with our *Cerfak 1300* (synthetic detergent) which provides a foam blanket. Saving of steel was the primary objective; no pitting was experienced; dross was reduced 25%; work came from acid tanks perfectly clean. Details upon request.

Sleeves in Salt

Cylinder sleeves and piston rings are isothermally heat treated in salt by a Cleveland manufacturer, at a saving reported to be as high as 15% over other methods. The mechanized series of salt baths includes a preheat in our *Liquid Heat 980*, high heat (1550°F.) in Liquid Heat 168, and quench in Mar-Temp Salt at 450-500°F. It's a faster, surer, modern method of heat treating which avoids distortion. Entire cycle is described in a recent "LINE" article, available on request, Circle "B" in coupon at right.

The Worm Turns



Steering gear assemblies—worm and roller —have to be carburized to wearproof the tough (5140) steel used. A Detroit manufacturer has long used *Perliton* Liquid Carburizer for this purpose, obtaining an .012" case in one hour at 1525°. Parts are oil quenched and drawn. Hardness of 56-60 RC is obtained. They like Perliton for its speed and dependability. For catalog, circle "C" at the right.

Want to Save $350?

That's what a collet manufacturer estimated he saves in one year by using Houghton's *Antisep* All-Purpose Base at 1:25 with water on a Conomatic. The operations include forming, deep drilling, champer, boring and cut-off. Surface speed is 85 fpm; feed .005". A cutting fluid at less than 7 cents a gallon means a real dollar saving, and this water-soluble base will perform as well or better than a straight oil on almost every cutting job. For data, circle "D" on coupon at right.

Here's helpful data—free!

A Houghto-Draw 357 Data Sheet describes compound for bar drawing.

B Isothermal heat treatment of cylinder sleeves and rings covered in Houghton LINE, June, 1949. Copies available.

C Perliton booklet covers products for liquid carburizing.

D Antisep All-Purpose Base—4 p. folder describes this unusual cutting fluid.

E "Handbook on Quenching" contains 60 pages of helpful data on the why and how of quenching.

Mail to

E. F. HOUGHTON & CO.

303 W. Lehigh Ave., Phila. 33, Pa.

Please send me the product literature I have checked below:

A B C D E

Name & Title.....

Company.....

Street.....

City & State.....

3-I

IRON AGE INTRODUCES

Continued

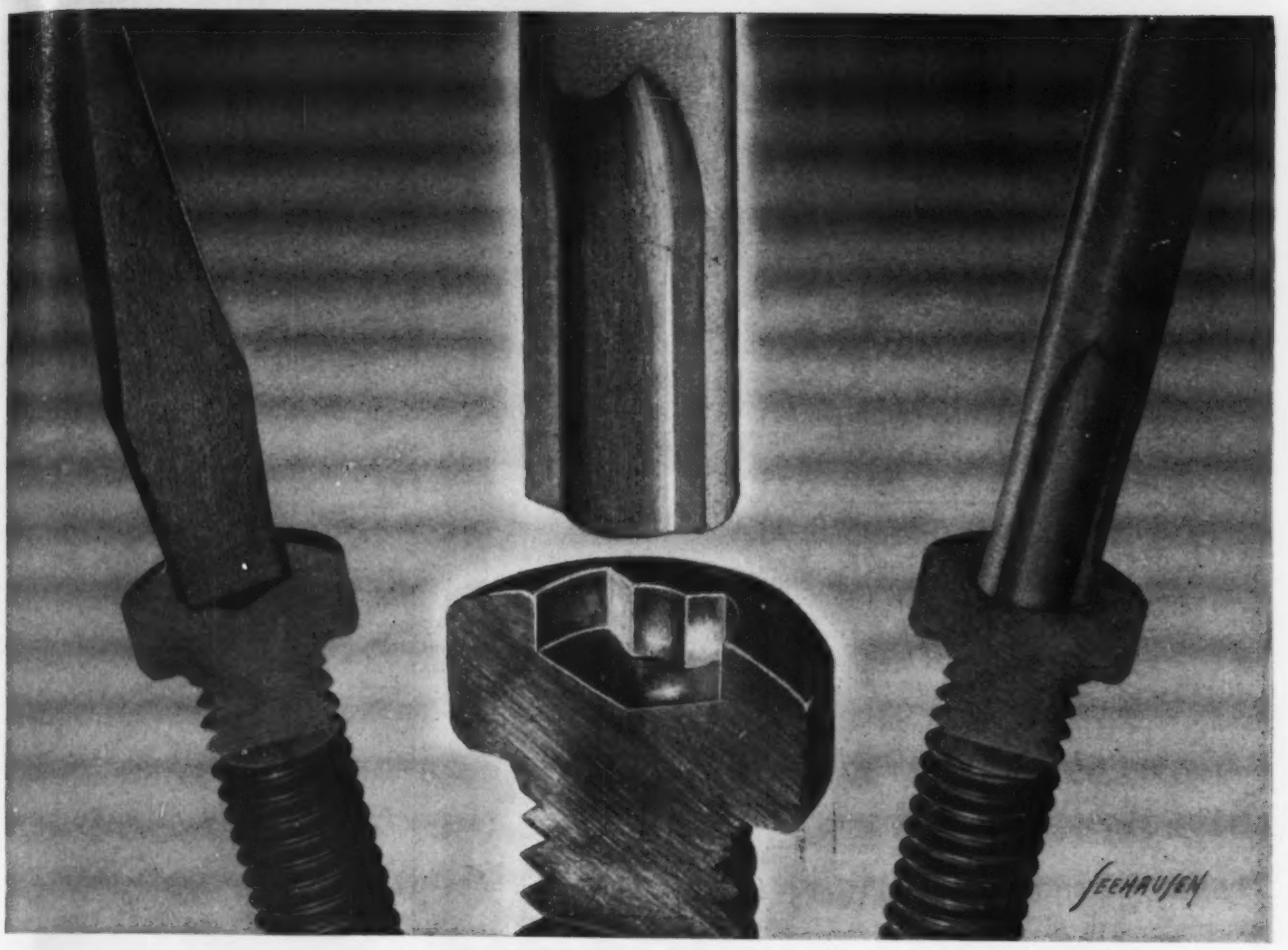
CHARLES MERTLER, manager of engineering and production, Stevens Mfg. Co., Inc.

Charles Mertler was appointed manager of engineering and production for STEVENS MFG. CO., INC., Mansfield, Ohio. Mr. Mertler had been associated with WESTINGHOUSE ELECTRIC CORP. at the Mansfield plant for the past 20 years.

Eric G. Orling becomes manager for pigment sales of the Cleveland branch of NATIONAL LEAD CO., N. Y. **R. B. Gilbert** continues as trade sales manager and **Thomas B. Williams** as assistant trade sales manager. Mr. Orling was first employed by the company in 1938 as a Cleveland branch salesman. **Carlton H. Rose** joined the staff of the company's office in Washington, D. C. In addition, he will carry on from Washington his duties as head of the specifications department, involving specifications for various products, test methods and other standards.

Dean Uhll, formerly western division service manager, was appointed export service manager for CATERPILLAR TRACTOR CO., Peoria, Ill. He will relieve **Ralph G. Dunn**, who for many years has served as export service manager in addition to his other administrative duties. At the same time the move will allow expansion of service activities to export dealers.

William F. MacDonald was elected president of E. F. HOUGHTON & CO., Philadelphia. He succeeds Major **Aaron E. Carpenter**, who was elected chairman of the board.



Here's How CLUTCH HEAD *Brings New Safety, New Speed in Line Assembly*

Q. What is the main cause of driver skidding? **A.** *"Ride-out" as set up by tapered driving.*

Q. How does CLUTCH HEAD overcome this "ride-out"? **A.** *By elimination of the tapered recess.*

Q. How does the CLUTCH HEAD engagement differ? **A.** *With straight sides of driver matching straight recess walls.*

Q. What safety benefit results from this engagement? **A.** *No slippage, so no damage to operators or work.*

Q. Does this eliminate need for end pressure? **A.** *Yes. No "ride-out" to combat; no end pressure; no skids.*

Q. Do CLUTCH HEAD users support this skid-free claim? **A.** *Many. Norge says "Cabinet damage eliminated."*

Q. What of this feature as a fatigue factor? **A.** *Effortless driving means more screws driven per day.*

Q. How does the Center Pivot Column add to safer driving? **A.** *It prevents canting by guiding bit into dead-center entry.*

Q. Why is CLUTCH HEAD "America's Most Modern Screw"? **A.** *Because it has features unmatched by any other screw.*

Q. What are these features?

A. *They include a recess engagement to match the ruggedness of the Type "A" Bit construction for driving up to 214,000 screws . . . non-stop; simple 60-second bit reconditioning; the Lock-On for easy one-handed driving, and basic design for common screwdriver operation.*

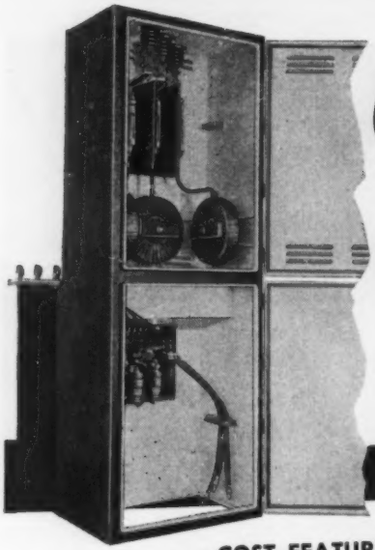
CLUTCH HEAD · SCREWS ·

Q. And how may we check them?

A. *You may check all of these features by sending for package assortment of screws, sample Type "A" Bit, and illustrated Brochure. These will come to you by mail and will give you an understanding why CLUTCH HEAD users report 15% to 50% increases in assembly production.*

UNITED SCREW AND BOLT CORPORATION

CLEVELAND 2 CHICAGO 8 NEW YORK 7



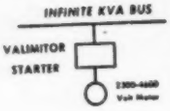
Cost Cutting Facts

about

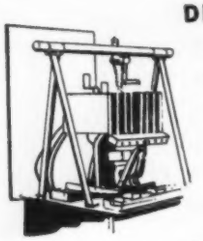
EC&M VALIMITOR Starters

for 2300-4600 Volt Motors

COST FEATURES — *One* initial cost (stand-by fuses not required). *Nothing* to replace (no fuses to blow). *No change* later on (increase in available KVA does not require redesign of starter).



PROTECTIVE FEATURES — *Safe* for connection to a bus of *any* capacity. *Magnetic* Overload relays have combined *instantaneous-trip* and *inverse-time-element trip* features. *Completely* enclosed, shock-proof starter construction. *Door-interlock* prevents opening disconnect switches under load.



DESIGN FEATURES — *Double-break* opening in each line by heavy-duty contactor having copper-tungsten contacts. *Contactor* may be raised to accessible position at top of tank without disconnecting any bolts or leads. *Unit construction* reduces installation time and material. *Low-voltage push button* circuit—from self-contained potential transformer.

OPERATING FEATURES — *Cushioned Starting* at no extra cost—when motor is up to speed, these starters function like any standard full-voltage starter. *Valimitor Starters* have high thermal capacity to withstand frequent starting—their heat inertia is equal to or greater than that of the average motor. *Valimitor Starters* may be used with high inrush motors. *Low up-keep costs*—the well-known ZHS Contactor has a reputation for dependability—long contact life and infrequent inspection.

PURCHASING SIMPLICITY — *No need to calculate* existing KVA. *No worry* about estimating future possible growth. *Order by* horsepower size, voltage, and frequency.

Before buying 2300-4600 volt motor control investigate EC&M VALIMITOR starters.

Write for No. 23 ACCELERATOR Bulletin

THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79th STREET • CLEVELAND 4, OHIO

IRON AGE INTRODUCES

Continued

David Dillman will join the staff of INLAND STEEL CO., Chicago, on Mar. 15, as manager of public relations. Mr. Dillman at present is managing editor of the Chicago Journal of Commerce, and has served in various other public relations and financial writing positions.

R. A. Roosevelt has been promoted to the position of sales manager of the ERIEZ MFG. CO., Erie, Pa. He replaces George R. Wellmen, who resigned.

JACK GODLEY, Washington, D. C., manager of the Nelson Stud Welding division, Morton Gregory Corp.

Jack Godley was named Washington, D. C., manager of the Nelson Stud Welding division of MORTON GREGORY CORP., Lorain, Ohio. He will coordinate all work with government services, agencies and bureaus which involve stud welding applications or specifications.

Umbert F. Corsini was named general superintendent of AMERICAN STEEL & WIRE CO.'s South Works in Worcester. The new general superintendent occupies the post vacated by **Van H. Leichliter,** whose appointment to assistant vice president of the company was announced recently. Mr. Corsini recently returned from a mission in Pakistan, India, where he surveyed the needs of that country in connection with its industrialization program.

Richard R. Tettelbach received the appointment as assistant advertising and sales promotion manager of the CLEVELAND CHAIN & MFG. CO., Cleveland.

HEARD THE LATEST ABOUT "FLEETWELD 5"?

The world's favorite electrode is back in the limelight again!

Have you used "Fleetweld 5" lately? . . . or talked to any of the thousands of welders who are using this 21-year-old world's leading electrode?

Do so and you'll discover:

This star performer is still tops for *bead shape, lack of slag interference* and *penetration* . . . the qualities that have made it the leader for these many years in class E-6010 welding.

But the stellar attraction today is a *plus value* . . . its

New smoothness of operation

"Fleetweld 5" now has a smoother, *more unidirectional arc.* For every inch of rod, the *arc is confined,* directed right into the joint. *Burn-off is uniform* at all times. The arc is *easier to handle* at all currents and in all positions. Hence, it is easier to get *smooth, uniform beads* . . . every inch of the way. This uniformity gives improved weld metal too!

These new advantages for the veteran of the shielded arc process have been made possible by Lincoln's development of a new "uniformity control" in manufacturing.

Users everywhere are enthusiastic about *every inch, every rod, every shipment* of "Fleetweld 5". Try it and see how it gives *you* the answer to every problem in E-6010 welding!

GET THE FACTS

Send for free Lincoln Welding for Mild Steel. Write

THE LINCOLN ELECTRIC COMPANY

Dept. 53, Cleveland 1, Ohio

LINCOLN

Sales Offices and Field Service Shops in All Principal Cities

A NEW BAR AND TUBE TURNER

✓ . . . automatic centering with roll-type positive, continuous feed

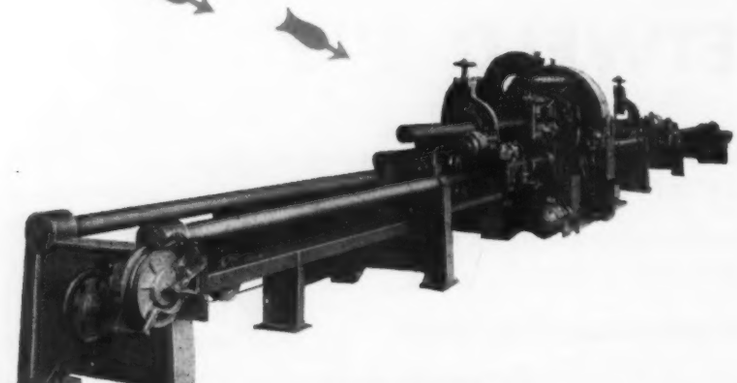
✓ . . . separate drives for cutting tool and bar feed for infinite ratios

✓ . . . two individual automatic-grip carriages

✓ . . . production on rough peel or precision work

✓ . . . 100% chip recovery

The new Medart RFRG type turning machine gives the exact ratio between cutting speed and bar feed rate for superior finish and close tolerance in precision turning, and high production on rough peeling or scalping. Speed and range of materials turned is limited only by the capacity of present day cutting tools. This new machine is completely push-button operated, and its improved, direct drive is actually simpler . . . easier to operate!



MEDART RFRG TYPE

MANUFACTURING ENGINEERS OF COMPLETE TRANSMISSION EQUIPMENT AND SPECIALIZED MACHINERY

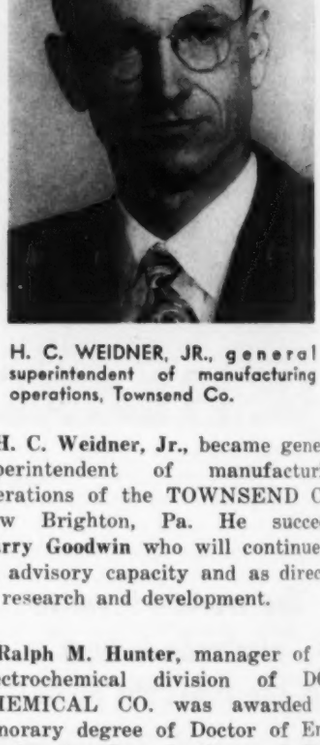
MEDART

THE MEDART COMPANY • 3560 DEKALB ST., ST. LOUIS, MO

IRON AGE INTRODUCES

Continued

Erskine W. Manterfield has been appointed director of public relations and advertising for the AMERICAN LOCOMOTIVE CO., Schenectady, N. Y. Mr. Manterfield replaces **Holmes Brown**, who has resigned to accept an appointment on the staff of COLONIAL WILLIAMSBURG, INC., the organization formed to carry forward the restoration of Williamsburg, Va.



H. C. WEIDNER, JR., general superintendent of manufacturing operations, Townsend Co.

H. C. Weidner, Jr., became general superintendent of manufacturing operations of the TOWNSEND CO., New Brighton, Pa. He succeeds **Harry Goodwin** who will continue in an advisory capacity and as director of research and development.

Ralph M. Hunter, manager of the electrochemical division of DOW CHEMICAL CO. was awarded an honorary degree of Doctor of Engineering by Case Institute of Technology, Detroit.

Joseph Schrader, formerly with the metallurgical department of Halcomb Works of CRUCIBLE STEEL CO., Pittsburgh, has been appointed assistant superintendent of the Electric furnace department at the company's Midland Works.

E. Eugene Lenrow was named sales representative in New York State for the METALS DISINTEGRATING CO., INC., Elizabeth, N. J. Mr. Lenrow will handle the sale of metal pigments, aluminum paste and powder and gold bronze powders in all counties except Niagara, Erie and Chautauqua.

Turn to Page 203

UNIVERSITY OF MICHIGAN LIBRARIES

Dear Editor

SCRAP DEALERS

You are to be commended upon the excellent editorial with reference to the "Scrap People" in the issue of Jan. 26. The article was so real and exact in every sense of the word that I think it was a real masterpiece. I enjoyed reading it and have called same to the attention of many of my steel mill friends, who also enjoyed reading your editorial.

H. H. MATLOW

Matlow Corp.
Syracuse, N. Y.

We were very much impressed with Tom C. Campbell's editorial appearing in the Jan. 26 issue. We thought it might be a good item to pass out among people interested in scrap and its disposal. If you have reprints of this editorial we would appreciate receiving sufficient copies for mailing.

S. J. HUNTER

I. Overman & Co.
Passaic, N. J.

Copies have been sent.—Ed.

We like your editorial of the Jan. 26 issue very much. In fact, we like it so much that we are considering having it run in our local newspaper, that is with your permission. Will you, therefore, please advise if it will be all right for us to have this editorial reprinted in our local newspaper?

S. L. ABRAMS

B. Abrams & Sons, Inc.
Harrisburg, Pa.

Permission granted.—Ed.

THANKS!

I have been trying to figure what I could buy with $8.00 that would give me more value and pleasure than 1 year of your f.f.j. and I have come to the conclusion that you will. Enclosed please find check for $8.00. The 95th Annual Review of January 5, 1950 is a marvelous job.

K. C. PHELPS

Alameda, Calif.

IRON POWDER

I was interested in the article in the November 3 issue covering domestic iron powder. Is the figure of $12.50 per net ton covering imports of Canadian iron an advalorem import duty, and under what classification?

I was interested, about 15 years ago, in the problem of supplying low-cost powdered iron for the powdered

The ABC of MST

ALWAYS MAKES POSSIBLE
BETTER PRODUCTS
AT LOWER COST

Michigan
The Modern Electric Resistance
WELDED
STEEL TUBING

ECONOMICAL • LIGHT WEIGHT • MACHINE-ABILITY • UNIFORM STRENGTH

ROUND
¼" to 4" O. D. 9 to 22 gauge
SQUARE-RECTANGULAR
½" to 2" 20 gauge 1" to 2¾", 14, 16, 18 gauge

Can be Bent,
FLANGED, EXPANDED, TAPERED, DEPRESS BEADED, EXPAND BEADED, ROLLED, EXTERNAL UPSET, INTERNAL UPSET, SPUN CLOSED, FORGED, BEVEL FLANGED, FLATTENED, SWAGED, FLUTED.

Consult us for engineering and technical help in the selection of tubing best suited to your needs.

At MICHIGAN we've never admitted there are such words as, "It can't be done!" That's why we've convinced thousands of manufacturers that MICHIGAN TUBING is an ideal, cost-saving product component. No matter what you manufacture, let us prove that the use of MICHIGAN TUBING can give you a better product and save you money.

A Quality Product,
can be worked in your plant or prefabricated by MICHIGAN.

RESISTANCE WELDED STEEL TUBING
Michigan STEEL TUBE PRODUCTS CO.
THE OLDEST MAKER IN THE DISTRICT

33 Years in the Business
9450 BUFFALO STREET • DETROIT 12, MICHIGAN
FACTORIES: DETROIT, MICHIGAN • SHELBY, OHIO

DISTRIBUTORS: Steel Sales Corp., Detroit, Chicago, St. Louis, Milwaukee, Indianapolis and Minneapolis—Miller Steel Co., Inc., Hillside, N. J.—C. L. Hyland, Dayton, Ohio—Dirks & Company, Portland, Oregon—James J. Shannen, Milton, Mass.—Service Steel Co., Los Angeles, Calif.—American Tubular & Steel Products Co., Pittsburgh, Pa.—Strong, Carlisle & Hammond Co., Cleveland, Ohio

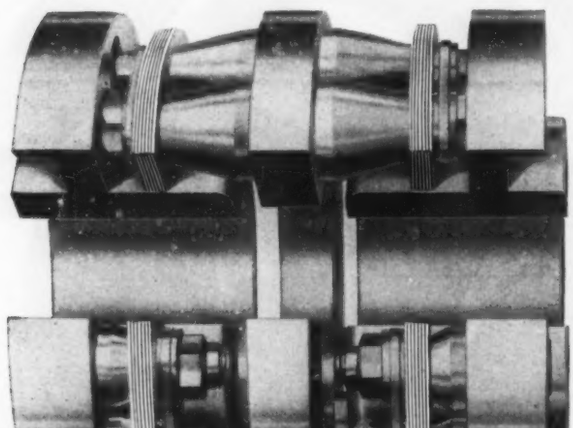
THOMAS *Flexible* ALL METAL COUPLINGS

FOR POWER TRANSMISSION • REQUIRE NO MAINTENANCE

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

Thomas Couplings have a wide range of speeds, horsepower and shaft sizes: ½ to 40,000 HP — 1 to 30,000 RPM.

Specialists on Couplings for more than 30 years



PATENTED FLEXIBLE DISC RINGS

BACKLASH FRICTION WEAR and CROSS-PULL are eliminated LUBRICATION IS NOT REQUIRED!

THE THOMAS PRINCIPLE GUARANTEES PERFECT BALANCE UNDER ALL CONDITIONS OF MISALIGNMENT.

• • •

NO MAINTENANCE PROBLEMS.

• • •

ALL PARTS ARE SOLIDLY BOLTED TOGETHER.

Write for the latest reprint of our Engineering Catalog.

THOMAS FLEXIBLE COUPLING CO.

WARREN, PENNSYLVANIA

DEAR EDITOR

Continued

iron industry. I erected a small pilot plant here capable of producing 2.5 tons per day. I sent a few 100 lb of my product, which was made from mill-scale, to the Amplex Div. of Chrysler Corp. for their inspection and testing. At that time they contended that my product, which had a density of 1.5, did not suit their uses. They were using Swedish powdered iron which had a density of 2.25.

Since I was to be unable to meet an important part of the specifications I shut down my small plant and abandoned further attempts to enter this field. I noticed in your article that some domestic fabricators must mix domestic iron with Swedish iron so I presume that present developments on compacting permits iron of a less density to be used than the Swedish iron.

At that time I lost all interest in iron powder production, but if it is now possible to use iron powder with a density between 1.5 and 2.0 it is my opinion that an iron powder as good as the Swedish powder can be produced and sold in this country for a price not to exceed 5¢ per lb (possibly less) if produced on a basis of 50 tons per day or more. The most formidable requirement is the source of a magnetite iron ore that can be ground and concentrated to a high degree of purity. Mill-scale and tin-cans can be used if they can be obtained in sufficient quantity at a reasonable price.

I would appreciate very much if you will tell me the present average density of irons that are now used in compacting.

H. G. S. ANDERSON
Muskogee, Okla.

The figure of $12.50 per net ton referred to is not an advalorem duty. This is a rate of 5/8¢ per lb charged under Treasury Decision 51802, paragraph 335, covering grit, shot, and sand in any form. More recent information indicates that it has been possible for the importer to obtain a reduction based on individual negotiations for each shipment at the same rate under which Swedish sponge iron is imported.

For certain electronic applications, iron powder is required with density ranging from 1.50 to 2.15. Iron powder density required for commercial parts production may be divided into three classifications: low, 2.0 to 2.3; medium, 2.4 to 2.6; high, 2.8 to 3.0. Carbonyl irons are produced in a range of density of 3.5 to 4.8.—Ed.

TRADE NAMES DIRECTORY

We have, in our library, many requests to identify various trade names. We do not have available the 1947 issue of your publication which carried an extensive list. If this list has been printed separately we would appreciate receiving a copy for use in the library.

B. V. DRAKE
Librarian
U. S. Chamber of Commerce
Washington

UNIVERSITY OF MICHIGAN LIBRARIES

FREE

PUBLICATIONS

Continued from Page 34

in a folder also containing specifications of Wel-Met cylindrical self-lubricating bearings. *Wel-Met Co. For more information, check No.* 10 *on the postcard on p.* 35.

Synthetic Packings

"Handbook on Synthetic Rubber Packings," a 110-p. reference book for design engineers and maintenance men, presents comprehensive information on fabricated and homogeneous packings, their design and application, and contains useful engineering reference data. *E. F. Houghton & Co. For more information, check No.* 11 *on the postcard on p.* 35.

Gaging Equipment

A new 36-p. catalog covers a complete line of gages, in addition to charts giving practical information of every day use for the users of this equipment, and shows the many sizes available as standard. *Cadillac Gage Co. For more information, check No.* 12 *on the postcard on p.* 35.

Lifting Clamps

Various models of Renfroe lifting clamps are shown in an 8-p. catalog listing prices of complete units and component parts. *J. C. Renfroe & Sons, Inc. For more information, check No.* 13 *on the postcard on p.* 35.

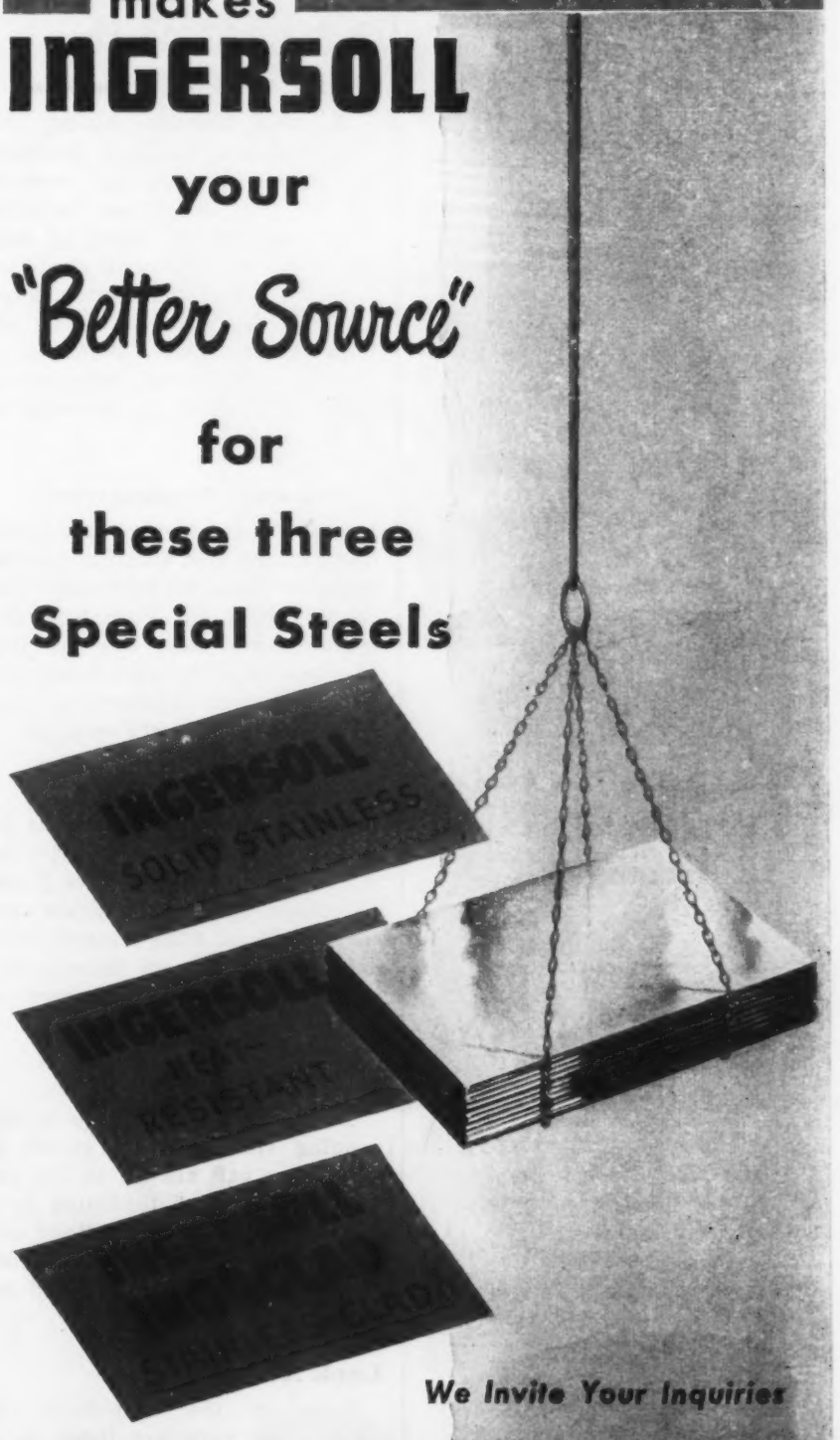
Car Thawer

Illustrated 6-p. folder describes the De-Icer, a portable device that thaws frozen coal in steel railroad cars by evenly distributing heat against the entire width of the car pocket. *J. C. Corrigan Co., Inc. For more information, check No.* 14 *on the postcard on p.* 35.

Gear Hobbers

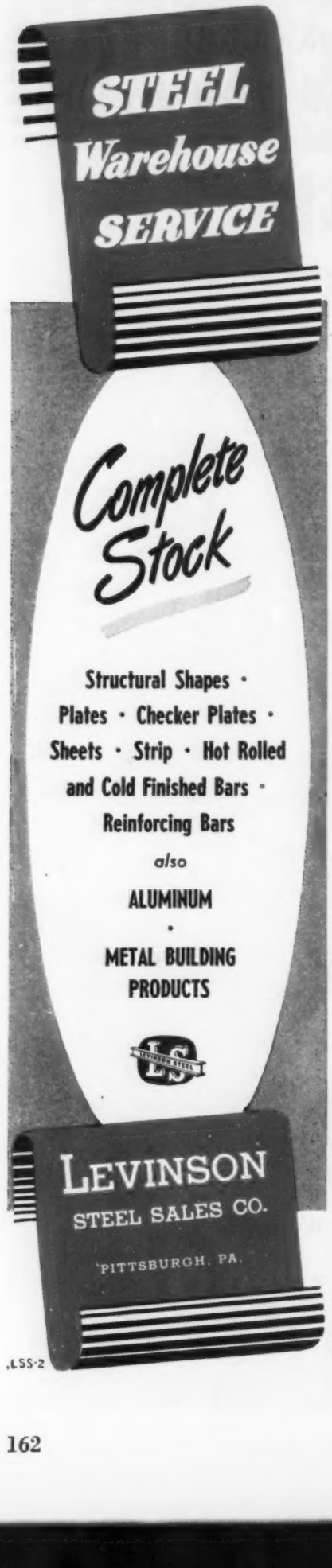
Complete specifications, descriptions and illustrations of G&E universal manufacturing gear hobbing

The Service You Want
on the STEELS YOU NEED
makes
INGERSOLL
your
"Better Source"
for
these three
Special Steels



We Invite Your Inquiries

INGERSOLL STEEL DIVISION
BORG-WARNER CORPORATION
310 South Michigan Avenue, Chicago 4, Illinois
Plants: Chicago, Illinois; New Castle, Indiana; Kalamazoo, Michigan



FREE PUBLICATIONS

Continued

machines and various attachments are supplemented by illustrated production examples in a new 26-p. catalog. *Gould & Eberhardt, Inc. For more information, check No.* 15 *on the postcard on p.* 35.

Drills, Reams, Punches

A new general catalog, No. 102, describes, lists and illustrates tools used in drilling, reaming and punching operations, including drills and reamers made of high speed, carbon, and cobalt steels and tungsten carbide, and interchangeable punches made of carbon and high speed steels. *Whitman & Barnes. For more information, check No.* 16 *on the postcard on p.* 35.

Corrosion Resistance

Enameling burning tools, pickling fixtures, heat treating carriers and alloy chain, all fabricated from special alloys for high heat and corrosion resistance are described in a new 8-p. booklet. *Strohecker Inc. For more information, check No.* 17 *on the postcard on p.* 35.

Protective Coatings

A new 8-p. bulletin contains information on coatings suitable for protection against corrosive fumes or splash on steel, concrete and wood surfaces. *Atlas Mineral Products Co. For more information, check No.* 18 *on the postcard on p.* 35.

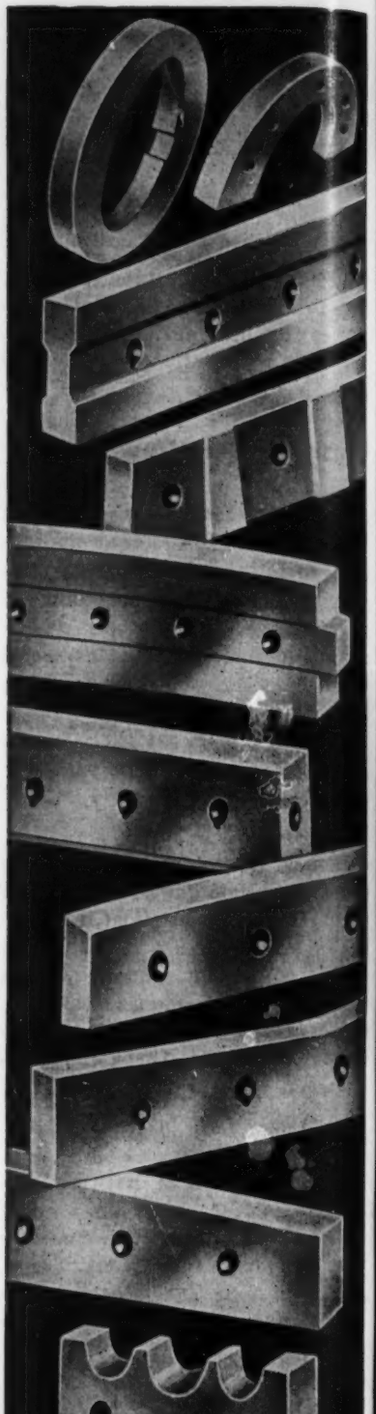
Hoisting Equipment

American general purpose hoists, ranging from 5500 to 10,000 lb single line pull and 50 to 100 hp, are described and ilustrated in a 16-p. catalog. *American Hoist and Derrick Co. For more information, check No.* 19 *on the postcard on p.* 35.

Lock Nuts

Some of the advantages of Palnut lock nuts are listed in a new 4-p. folder illustrating a number of applications and giving two revealing case histories. *Palnut Co. For more information, check No.* 20 *on the postcard on p.* 35.

Resume Your Reading on Page 35



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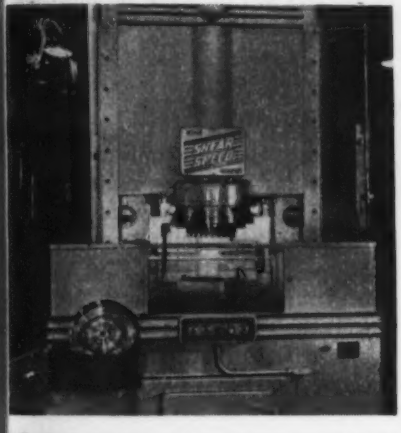
NEW PRODUCTION IDEAS

Continued from Page 38

Internal Gear Machines

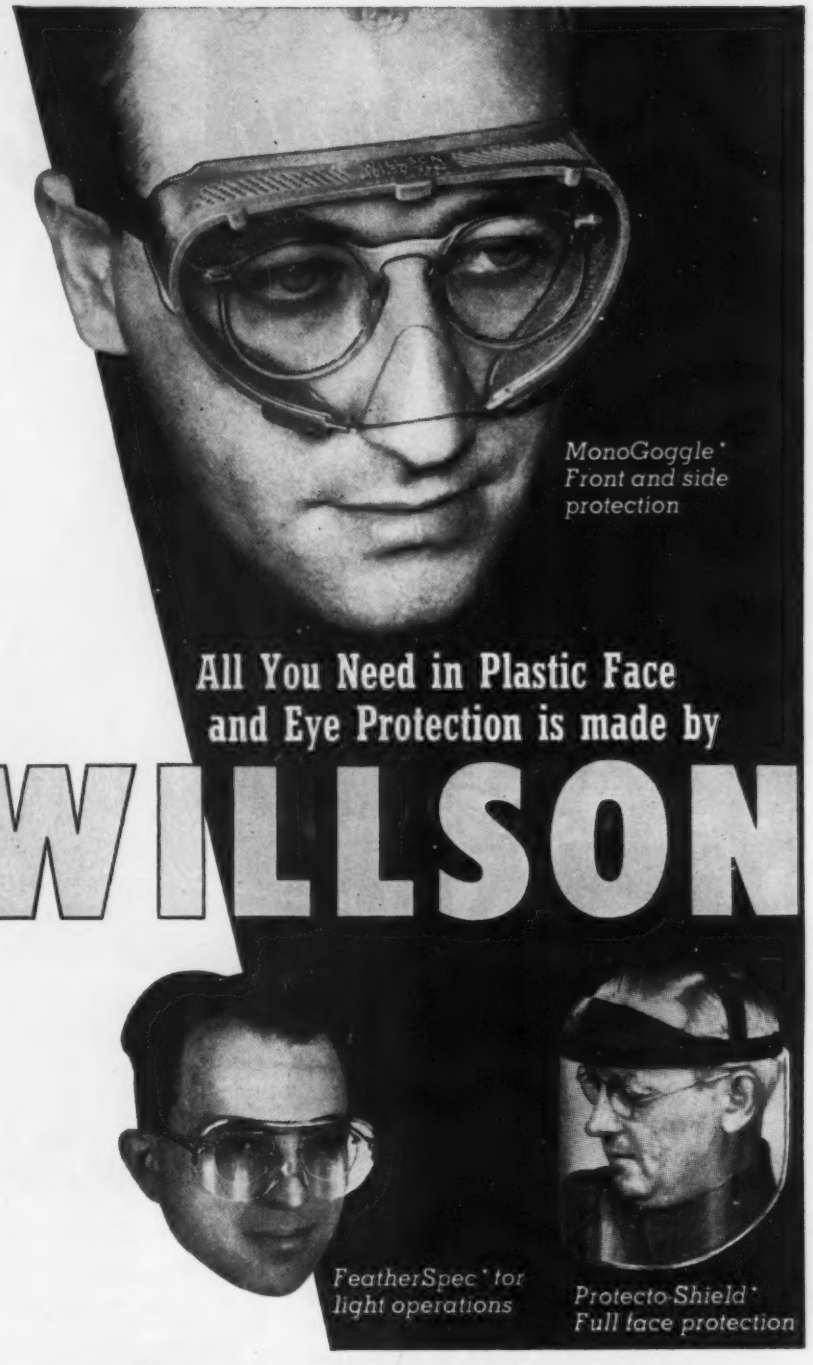
Shear-Speed machines for cutting internal spur gears, splines and miscellaneous forms that lend themselves to form-cutting with radially fed tools handle work with 5.4 in. ID minimum and 20 in. maximum ID. In operation, the internal gear machine reverses the tool-feed action of the machines used for cutting external forms. Using two inverted cones, the tools are fed outward before each stroke



of the reciprocating work and its holder. They are retracted slightly before the return stroke to prevent tool drag. Feed is decreased to finish-feed as proper depth of cut is approached. Machine cycle time for 12-in. pitch diam gears is rated at 24 sec for an hourly production of 85 to 90 parts. *Michigan Tool Co. For more information, check No. 33 on the postcard on p. 35.*

Coordinators

Coordinators offer a new method of positioning machine elements accurately and quickly. They locate a pattern of holes and reproduce the pattern as often as desired, through preformed records known as Micro-Patterns. These Micro-Patterns are cut and checked on a Recorder. Coordinators are attachments to machine tools; they do not affect the normal operation of the machine tool. Accuracy is con-



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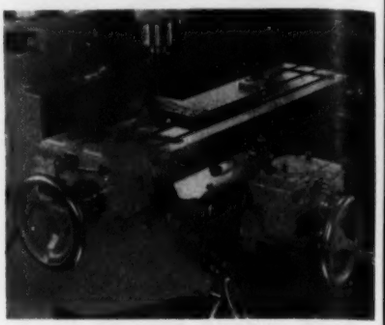
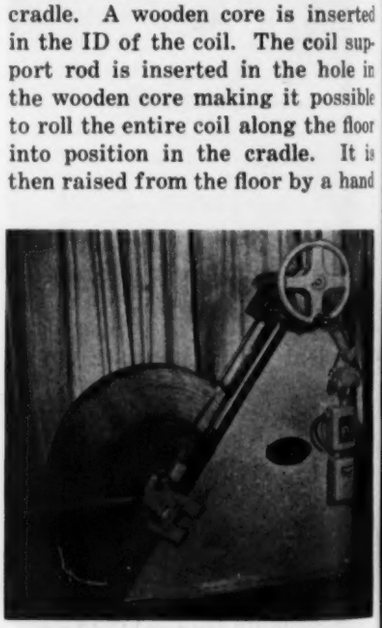
trolled by the Micro-Patterns and does not depend on the skill of the operator. Coordinators will compensate for errors in the pitch of traverse screws and racks in appli-



cations where the errors are beyond required tolerances. *Benzon Machine Co. For more information, check No.* 34 *on the postcard on p.* 35.

Coil Cradle

Saving time in loading coils is claimed for a new automatic coil cradle. A wooden core is inserted in the ID of the coil. The coil support rod is inserted in the hole in the wooden core making it possible to roll the entire coil along the floor into position in the cradle. It is then raised from the floor by a hand



wheel which actuates elevating screws. Coils up to 40 in. OD and up to 1000 lb can be handled. Width capacity of material is 6 in. The cradle is equipped with hardened and ground feed rolls, mercury switch control and motor for operation on 220/440 v 3 phase, 60 cycle, ac. *U. S. Tool Co. For more information, check No.* 35 *on the postcard on p.* 35.

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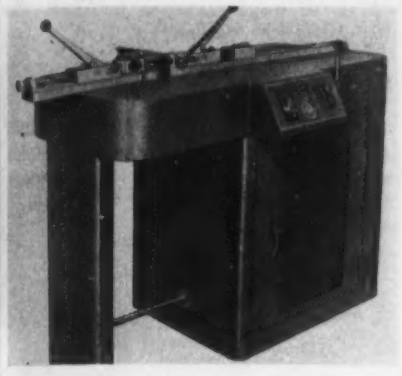
Power Bender

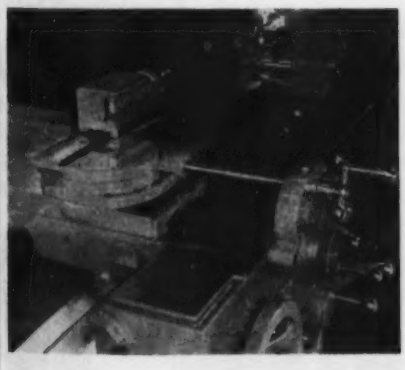
The Di-Acro Hydra-Power Bender provides a simple, trouble-free hydraulic power unit for forming simple, compound and reverse bends. A smooth even flow of power is assured by the Vickers hydraulic system incorporated in



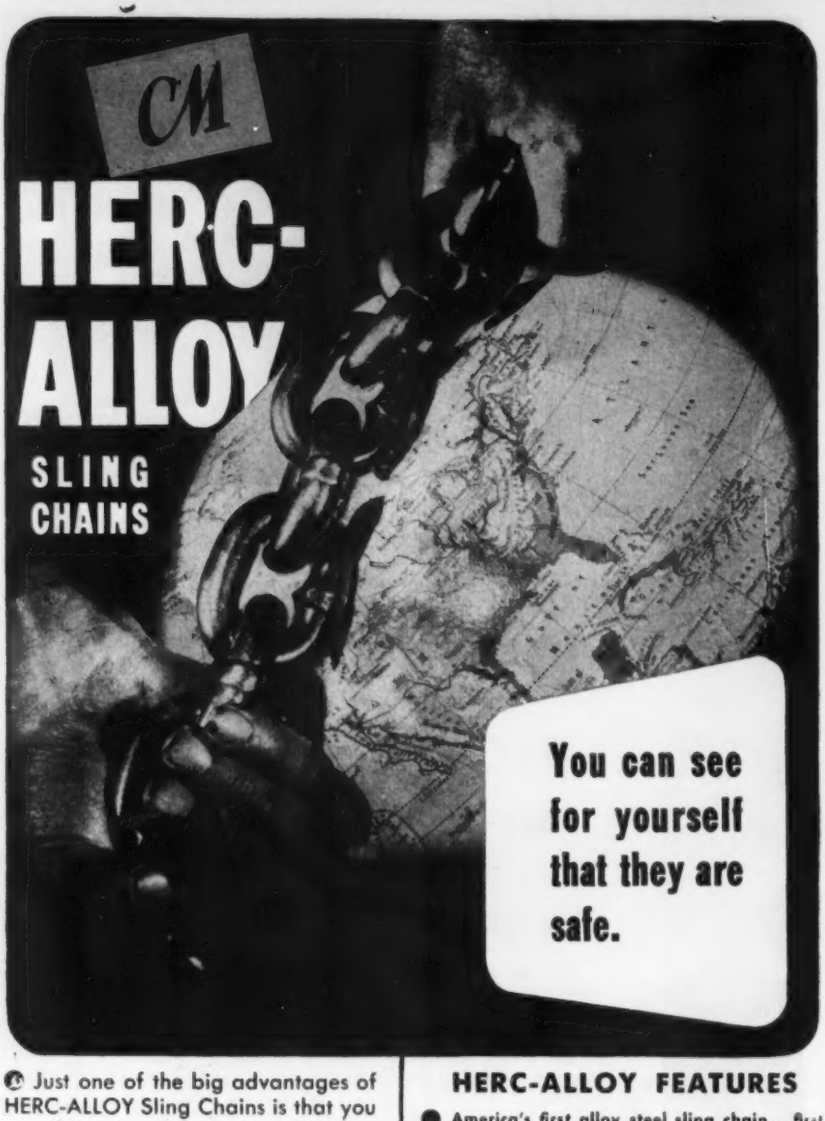
the machine. Correct bending speeds are controlled by a variable flow control valve that allows infinite speed adjustment, and centralized location of all controls eliminates lost motion for the operator. *O'Neil-Irwin Mfg. Co. For more information, check No.* 36 *on the postcard on p.* 35.

Ball Turning Rest

An improved ball turning rest contributes to more efficient performance and smoother operation on Monarch 14, 16, and 20-in. Series



60 engine and toolmaker's lathes. The new design simplifies setup and its application to the machine is a simple, quick procedure. The regular bottom slide may be positioned on center for ball turning or boring, or out of alignment with the spindle center for spherical radius turning. A micrometer dial adjusts the bottom slide in or out. Diameter of the ball radius being turned



Just one of the big advantages of HERC-ALLOY Sling Chains is that you can determine their serviceability by a simple visual inspection.* Ordinary steel or iron chains, on the contrary, grow dangerously brittle with age... an insidious threat to the safety of men and materials. That's why more and more of the important companies are standardizing on HERC-ALLOY Sling Chains...because you can see for yourself that they're safe.

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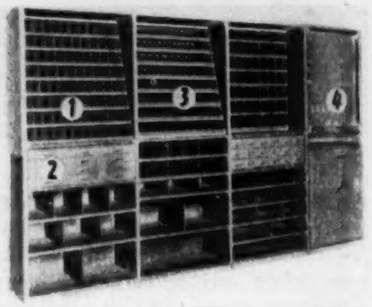
can be controlled by a similar micrometer adjustment. Four, 5¾, and 6-in. balls can be turned on the 14, 16, and 20-in. lathes respectively. *Monarch Machine Tool Co. For more information, check No.* 37 *on the postcard on p.* 35.

Storage Equipment

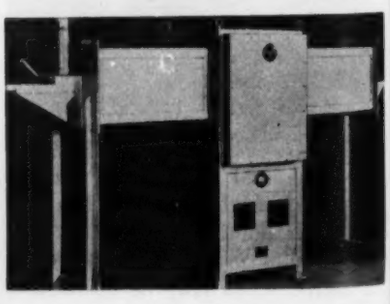
Storage equipment for tool rooms and stock rooms includes tool racks with (1) sloping front unit that



provides 88 openings in 8-in. depths with shelf dividers adjustable every inch; (2) drawer case unit having five dividers; (3) sloping shelf unit with 108 compartments on eight shelves for storing drills, reamers and taps; (4) swinging panel that allows 27 ft of storage area and has holes punched every inch for milling cutters, gages and templates. *Lyon Metal Products, Inc. For more information, check No.* 38 *on the postcard on p.* 35.

Tunnel Kiln

Versatile design of pilot tunnel kilns for fast cycle firing permit variations in firing cycles to allow

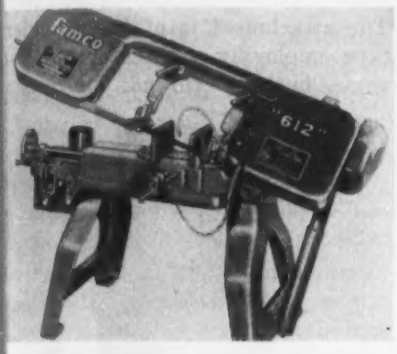


duplication of schedules. Firing schedules can be established at a first low cost of equipment, thus reducing rejections on production runs. They are used in test firing of ceramic powders, steatite, elec-

trical porcelain, insulators, resistors, spark plugs, grinding wheels, and electronic components. *Harper Electric Furnace Corp. For more information, check No. 39 on the postcard on p. 35.*

Band Saw

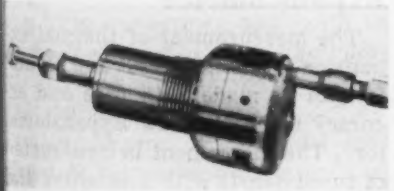
The Model 612 metal cutoff band saw handles capacities up to 6 in. round and 6x12 in. rectangular stock, accommodating all shapes and types of metals. Featuring a ½ hp motor and a Timken roller



bearing equipped transmission, the machine employs a ⅝ in. x 0.032 blade and is capable of 50, 100, 175 and 300 fpm cutting speeds. The machine is ruggedly built of semi-steel castings and alloy steel and has cast aluminum safety guards. *Famco Machine Co. For more information, check No. 40 on the postcard on p. 35.*

Air Turbine Grinder

A new air turbine motor has been introduced with an automatic governor control. In operation, used on an Onsrud Dl-G air turbine grinder, as the grinder is held against the work, and a resistance



is built up that begins to reduce rpm, the automatic governor cuts in a greater air volume to maintain rotational speed. The automatic governor is actuated by centrifugal force, developed by the rotation of the grinder spindle. The motor is designed to operate at 50,000 rpm and as long as this rotational speed

5 important advantages of Metal Cleaner No. 5

Cleaning with Wyandotte Metal Cleaner No. 5 is a fast, sure, low-cost operation. This versatile product is balanced for top performance in rotary or tumble barrel, rotary washer or low to medium pressure spray washing. And it is well adapted to immersion cleaning or electrocleaning of ferrous and nonferrous metal parts because of these advantages:

1 Wyandotte No. 5 is a free-flowing, all-soluble cleaner.

2 It is well inhibited . . . excellent for cleaning copper alloys under all conditions.

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4 It has exceptionally fine detergency on all types of soils.

5 It has good rinsing qualities.

For complete technical information on Wyandotte Metal Cleaner No. 5 or any other metal cleaning product in the complete Wyandotte line, just write:

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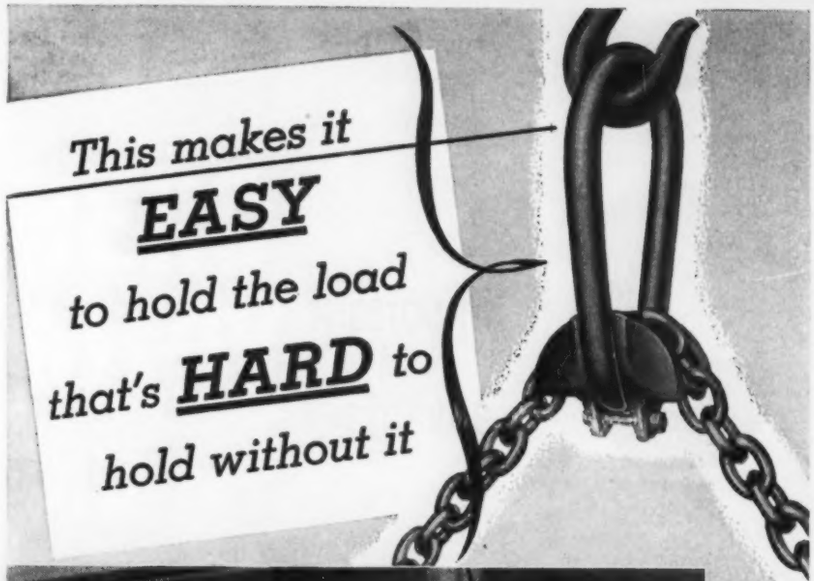

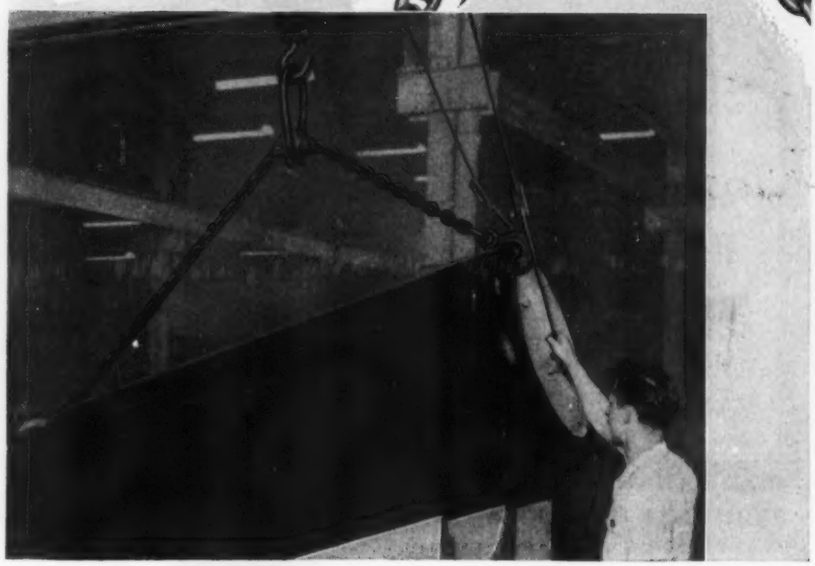

The New ACCO Sling Chain Adjuster

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• It comes as a complete unit—Pear Shaped Link, Adjuster and Single Sling with hooks at both ends. Slings of "85" and "125" ENDWELDUR steel chain—from ½" to ⅞"—Link and Adjuster sized to correspond to size of chain. Length of chain to your specification.

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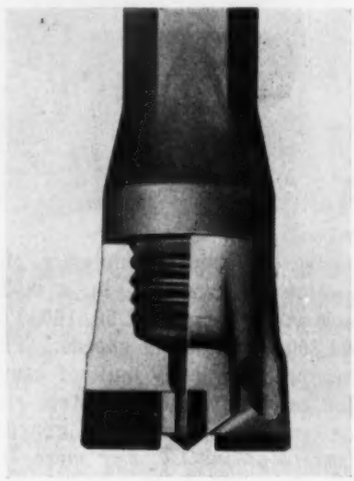
is maintained, the governor is not actuated. As the rpm decreases due to work load, the governor becomes operative. *Onsrud Machine Works, Inc. For more information, check No. 41 on the postcard on p. 35.*

Carbide Bit Attachment

A new attachment developed for tungsten carbide bits enables users to realize the full drilling economies possible with Carset Jackbits. The attachment is of the shoulder type employing a patented 38° reverse buttress thread. It resists



shock and impact while preventing slippage, excessive thread wear, or loss of drilling speed. Form, pitch, and size of the thread used have been selected to give both attachment and bit maximum thread life. *Ingersoll-Rand Co. For more information, check No. 42 on the postcard on p. 35.*

Expansiometer

The measurement of thermal expansion in metals, sands and ceramics can be made with ease and accuracy using the new Expansiometer. The instrument is constructed of fused quartz with a sensitive dial indicator attached. Samples may be up to 1⅛ in. diam x 3 in. long. Measurements at temperatures up to 2500°F are obtained by inserting the Expansiometer horizontally into any suitable furnace. *Harry W. Dietert Co. For more information, check No. 43 on the postcard on p. 35.*

Resume Your Reading on Page 39

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Advanced Fastening Methods Produce Lower Assembly Costs

Mansfield, Ohio—Warning that there is little possibility of making further reductions in the cost of materials and labor, Harold W. Kost, president, Prestole Corp., Toledo, Ohio, advised manufacturers to examine the fastening methods used to assemble their products.

Speaking before a fastening clinic of administrative and technical personnel of Westinghouse Electric Corp. and Prestole Corp. representatives, Mr. Kost declared that more efficient fastening methods can produce substantial reductions in the final cost of a product.

More than 50 department heads and members of their engineering, drafting, tooling and cost reduction divisions of Westinghouse met with Prestole representatives to determine how advanced fastening methods could help reduce assembly costs.

Cost-reducing Methods Shown

One of the many cost-reducing fastening methods demonstrated at the meeting is called "Prestolizing." It completely eliminates the handling of separate fasteners. Manufacturers are licensed to use the process and, by setting up Prestole punches and dies in their own presses, thread-engaging impressions are formed directly into panels, brackets and other structural parts of their products. Conical in shape, these impressions provide a full, 360 deg grip on screws and bolts to resist loosening. Cost of the operation is as low as 23¢ per 1000 fasteners.

Also shown were individual Prestole fasteners for use in locations not suitable for "Prestolizing." The same conical thread grip is formed in these fasteners, which are specially shaped to conform with assembly requirements. Some are welded in place, some snap into assembly position, while others are applied by hand. Welding types provide necessary reinforcement at fastening locations.

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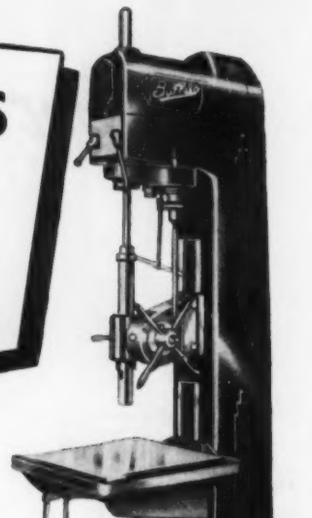
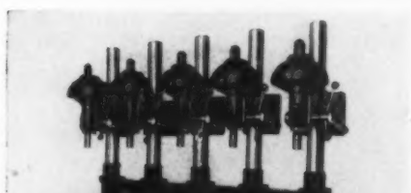


In "Buffalo" metalworking tools you'll find the convenient handling, the rigid accuracy and the rugged endurance so valuable in keeping costs down in any shop. For instance—



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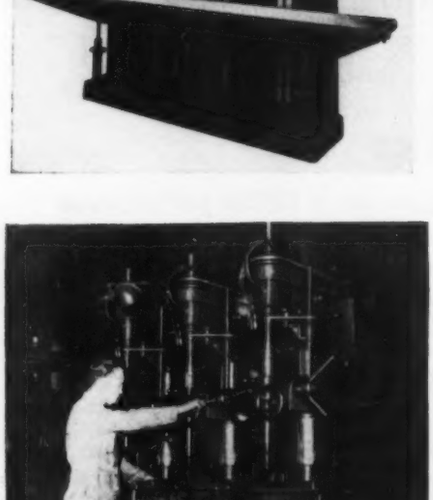
Without shutting off motor, you can select the right drilling speed for the job at the touch of a lever on this popular "RPMster"! 99" high. 27" space under spindle nose. WRITE FOR BULLETIN 3257.

"BUFFALO"
No. 18 Drills

handle up to 1" holes in cast iron. Available in 12 models to suit almost any requirement. 1 to 6 spindles, floor or bench types. WRITE FOR BULLETIN 3123-B.



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Philadelphia Equipment Sales Estimate Is $45 Million in '50

Philadelphia — Expenditures of $45 million for equipment in the Philadelphia area during 1950 were predicted in a speech delivered to machinery dealers at the January 28 meeting of the Machinery Dealers' National Assn. here. E. B. Aldorfer of the Federal Reserve Bank of Philadelphia, speaking before the group, pointed out that a reliable survey by his organization indicated the following facts:

This old manufacturing center is fighting for a more favorable competitive position with the recently equipped industrial centers of the West and South. Local manufacturers are planning to spend more money on equipment than on construction in the year to come. Emphasis upon plant modernization rather than mere expansion of floor space is being planned. Figures of $43 million spent last year on construction as contrasted with a scheduled $39 million for 1950 indicate that outlays for new plant have adjusted to a nearly normal level. Readjustment in demand for new equipment has not yet been completed, as revealed by the fact that outlays for equipment are apparently going to be about one-third less than last year.

Mr. Aldorfer proved this point by giving proposed figures for this year as compared with those of 1949. He stated that equipment expenditures in the Philadelphia area amounted to $48 million last year. Proposed scheduling calls for $45 million in 1950.

Some indication of the reliability of these estimates, he pointed out, could be seen by a comparison of estimates made a year ago with actual results. In September, 1948, local businessmen estimated that they would spend $113 million on capital outlays in the ensuing year. Actually they spent $111 million, which comes within 2 pct of the estimate. Results have shown that the forecasts are good on the whole, but not necessarily in the parts.

With regard to nationwide capital expenditures, Mr. Aldorfer

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pointed out that Philadelphia activity could not be regarded as a reliable barometer. The manufacturing industries throughout the country attained their peak dollar volume of capital expenditures in 1948 when total outlays were $8.3 billion. In Philadelphia the peak occurred a year earlier, and the rate of decline after that time was much sharper than that of the rest of the nation.

Court Upholds Ore Valuation

Salt Lake City—A Utah district court has upheld the state tax commission in a dispute with Geneva over valuation of iron ore for tax purposes. The company maintained that the value of the ore was fixed by the price actually paid by Geneva to its mining subsidiary—Columbia Iron Mining Co. It contended that this was an "arms length" transaction inasmuch as the contract was inherited from the Reconstruction Finance Corp. and because the mining company has sold ore to a competitor (Kaiser Steel Corp.) and is still obligated to sell to any operator of the surplus blast furnace at Ironton at the same price paid by Geneva.

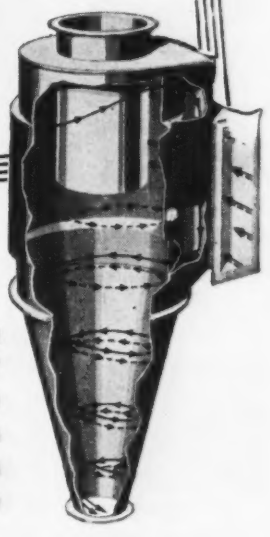
The court held that the sale by one subsidiary company to another subsidiary was an internal transaction and did not establish the real selling value of the ore. The decision means that the tax commission may value Geneva's ore on a basis of prices paid by Colorado Fuel & Iron Co., Kaiser or other independent companies.

Welding Conference to Be Held

Columbus, Ohio—The welding engineering department at Ohio State U. has announced completion of the program for the 11th meeting of the Ohio State Welding Engineering Conference.

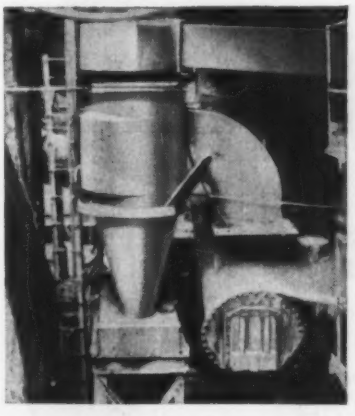
Some 300 engineers, designers and production supervisors from Ohio and neighboring states are expected to attend the campus meeting, April 14 and 15. This year's conference theme is "Economy in Design and Production."

Now... a Dust Collector that Cleans Waste Gas Efficiently!



Are you concerned about the high cost of shutting down your waste gas boilers for frequent cleaning? At a ferro-manganese blast furnace, a Buell System has lengthened the interval between waste gas boiler cleanings from two to fourteen days. Yet gas in ferro-manganese operations presents one of the most difficult dust problems known.

Clogging, the most serious obstacle to cleaning high-temperature waste gas, is virtually no problem with a Buell System. Engineered split-duct manifolding prevents overloading one cyclone to the clogging point, while others loaf. Besides, there are no small, easily clogged ducts in these large cyclones. Yet the patented van Tongeren 'Shave-Off' produces much higher efficiency than is possible with ordinary cyclones.



Before this Buell System was installed, waste gas boilers had to be cleaned every two days. Now they are cleaned once every fourteen days.

The combined knowledge of Buell's engineering staff is at the disposal of anyone with a difficult dust problem. Write us your problem. Buell Engineering Company, 70 Pine Street, Suite 5065, New York 5, N. Y.

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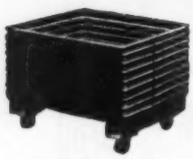

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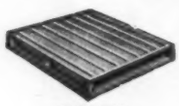

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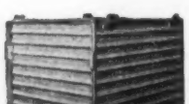
Whatever your operation, *Powell* materials handling specialists can design and build equipment that will speed your production and lower your costs. And you'll be pleasantly surprised at the low initial costs.

So, before you buy, check with **POWELL** *--originators of cold formed all-steel handling equipment.*

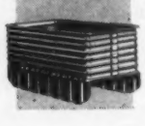
EVERYTHING IN MATERIALS HANDLING CONTAINERS



COLLAPSIBLE BOXES

DUMP BOXES

POWELL
PRESSED STEEL



DEPT. 44, HUBBARD, OHIO

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ARMSTRONG Lathe Dogs give extra service because they are drop forged from selected open hearth steel, and are heat treated to extreme toughness and stiffness. Hubs are made large enough to permit re-tapping, screws are also of special analysis steel and are hardened at the point to prevent upsetting. ARMSTRONG Dogs come in 10 types with square head or safety headless screws, with straight or bent tails. They are carried in stock by your local ARMSTRONG Distributor.

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Allegheny Ludlum Salesmen Briefed on Enlarged Capacity

Pittsburgh—Now that its $28 million plant improvement program is just about completed and in operation, Allegheny Ludlum Steel Corp. top management officials are making certain that the entire sales force is acquainted with the company's new capacity to produce a wider range of products with improved quality control.

Major phases of the plant improvement program already in production include a new electric melting department, a new blooming mill at Brackenridge, Pa. and a blooming mill at Watervliet, N. Y.

Union Pacific Buys New Diesels

Omaha, Neb.—Added to the growing fleet of Union Pacific R.R. diesel locomotives will be 35 new units scheduled for delivery this year from the Electro Motive Div. of General Motors. Totaling $4.9 million, the order includes 10 passenger power units and twenty-five terminal switchers, A. E. Stoddard, president of the railroad, announced.

The new passenger power units are the most powerful developed, producing 2250 hp each. Five will be cab units containing the engineer's cab and controls. The remaining five will be booster units. These booster units will be operated in conjunction with the cab units to produce five 4500 hp diesel-electric locomotives.

Buick Marks Production Record

Detroit — Buick Motor division set an all-time production record recently when 2249 engines were assembled in a single day.

The production pace at Buick has been stepped up appreciably since the turn of the year according to E. T. Ragsdale, general manufacturing manager.

Daily engine production of the new F-263 powerplants developed for 1950 Super series cars has been sharply advanced Ragsdale said.

UNIVERSITY OF MICHIGAN LIBRARIES

Dear Customer

by Jack R. Light

CIUDAD BOLIVAR: Now who would ever think that you would run across a dateline like that in your iron and steel magazine? But there it is. Right on p. 75 with the byline of the editor of THE IRON AGE.

For a number of years the argument has been raging on the future of iron ore supplies for the steel industry in this country. For decades more than 80 pct of the ore consumed has come from the Lake Superior deposits. For years now drumbeaters of different types have been warning that those rich ore deposits ought to be saved for future wars, and/or that they are about depleted. The debate has been beclouded by a theory that the tax structure of the State of Minnesota is such that it doesn't pay for a steel company to "discover" ore up there too long before it is ready to start scooping it up, because as soon as it is "discovered" someone has to start paying taxes on it. O lot of the people who own or control various marginal low grade ore deposits have also been athletically attempting to turn off the faucet at Duluth—for reasons of their own.

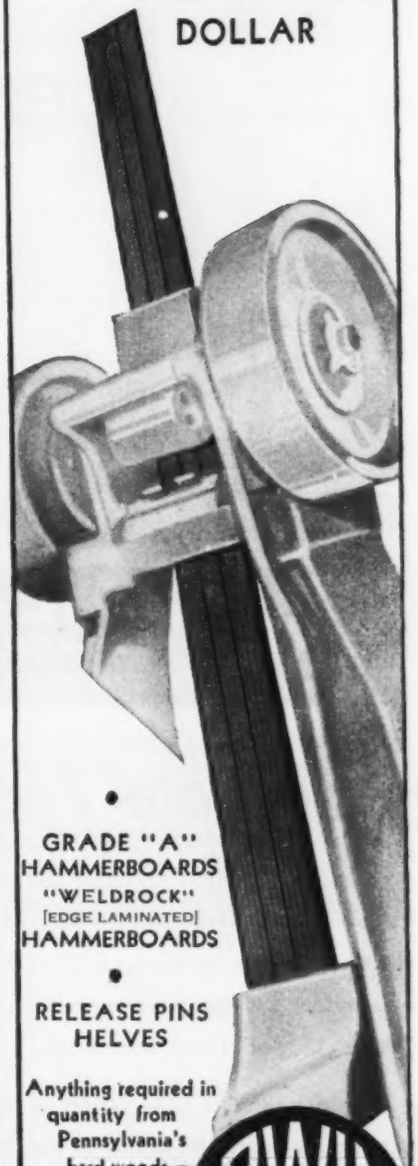
Against this background any discussion of new major ore deposits is bound to be interesting to any man who is concerned about the price of steel in this country. The three major new factors in this subject at the moment are the low grade ores available in the Lake Superior region after the high grade Mesabi ores are gone, the big strike in Labrador, and the Cerro Bolivar deposits in Venezuela.

The editor of THE IRON AGE has visited both these big new fields, and in this issue gives you his impressions and conclusions on the place of the Venezuelan ore in the future economy of the U. S. His trip to the iron mountain range in South America cost him untold hardships. He flew 5000 miles with Pan American in constant danger of having coffee spilt on his sleeve. He bumped down from Caracas to Ciudad Bolivar on the domestic airline with the threat of nausea dogging every mile of the trip—and you can't get insured for that. He undertook miles of primitive trails through virgin terrain with nothing but a jeep between himself and walking—and not even an aircushion between jeep and Campbell.

He took his own look at the Orinoco River, upon whose waters millions of tons of ore will float. Nothing but a remodeled private yacht stood between him and the alligator infested muddy waters of the 2½ mile wide swirling river. It was a rough trip, all in the name of first person journalism, and as the proverb goes, he never had it so good.

IRWIN

MORE FORGINGS *per* HAMMERBOARD DOLLAR



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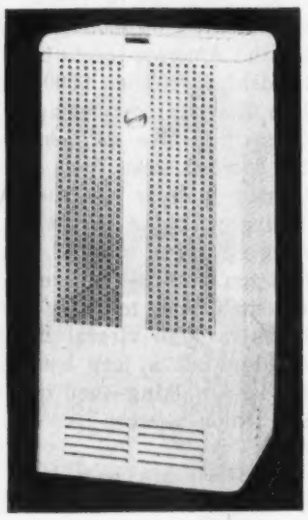
Ornamental Perforated Metal

A particularly attractive application of Hendrick Ornamental Perforated Metal is its use for stove panels, as shown in the illustration of a model manufactured by the Queen Stove Works, Inc., of Albert Lea, Minn.

Hendrick offers a wide variety of decorative patterns, regularly furnished in steel sheets of available stock sizes, in gauges from 16 to 22. These patterns can also be supplied in other metals on special order. Write for full information.



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Strike Puts Jones-Laughlin Fourth Quarter Earnings Down

Pittsburgh—A poor fourth quarter due to the strike of the United Steelworkers of America cut sharply into 1949 earnings of Jones & Laughlin Steel Corp., which were off nearly $10 million from 1948.

The company reported net income for the year of $20,961,245, compared with $31,222,451 in 1948. Fourth quarter earnings were $922,327, equal to 22¢ per share of common stock, compared with 1948 fourth quarter income of $10,973,134, equal to $4.28 per share.

Earnings for 1949 were equal to $7.50 per share of common, while 1948 income represented earnings of $12.01 per share.

J. & L.'s board of directors declared a dividend of $1.25 per share on the 5 pct cumulative preferred stock, Series A, to holders of record March 10, 1950, payable April 1, 1950. Dividend on the common was 65 cents per share payable April 1 to holders of record March 10.

Wilbur S. Warner Passes On

Bridgeport—The J. L. Lucas Co. of this city has announced the passing of Wilbur S. Warner, one of the pioneers in the used machinery industry, and formerly associated with this firm. Mr. Warner, well-known, and well-liked throughout the industry, recently died in Florida after a year's inaction. Previous to this he was engaged in selling, inspecting and appraising machinery for the Lucas Co., a post he held he held for 16 years.

National Earns $39 Million

Pittsburgh — National Steel Corp. in a preliminary statement reports net earnings of $39,311,269, equal to $16.02 per share, compared with 1948 earnings of $40,121,506, equal to $16.35 per share.

E. T. Weir, chairman, said 1949 earnings were after provision of $25,021,857 for depreciation and depletion, including accelerated

depreciation, charges against income of $615,000 to cover retirement benefits under labor agreements, and provision of $2 million in connection with claims against the corporation which are being contested.

The company would not elaborate on the significance of the claims.

No Gain in New Water Rates

San Francisco — Reductions in waterborne freight rates on steel from Pacific Coast points to Manila and Hong Kong, while very welcome, fail to give western producers any advantage over eastern shippers as had been hoped.

Cuts made by the Atlantic Far East Conference established rates which are still approximately the same as Pacific Coast rates. By the time West Coast port charges are added to the new and lower rates they become approximately on a par with shipments from the Atlantic Coast direct to the Orient. On sheets, bars, angles and most recently on plates, rates are now $16.75 per long ton; tinplate, $19.75 per long ton, and nails $18.75 per long ton. A $20.00 rate still applies to beams and channels. Producers are attempting to have these two products and others included under the new lower rates.

N. Y. Central Orders 4,500 Cars

New York—The placement of orders for 4,500 freight cars, to cost $23,700,000, has been announced by the New York Central System. This is the largest single purchase of freight cars since the same road's order for 5,350 in Dec., 1948. Deliveries are scheduled to start in May and be completed this year.

Included in the order are 2,000 box cars for the New York Central and 1,500 gondolas and 1,000 box cars for its subsidiary, Pittsburgh & Lake Erie R.R. The cars will be built by Pullman-Standard Car Mfg. Co. and Despatch Shops, Inc., a Central subsidiary.

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Look for this Mark of STERLING Quality

Sterling WHEELBARROWS

A. M. Byers' Management Wins Representation Battle

Pittsburgh—The management of the A. M. Byers Co. has defeated an attempt by a group of New York City stockholders to elect representatives to the company's board of directors.

Final outcome of the proxy battle was the re-election of all nine of the company's directors by a vote of 199,856 to 64,481. The announcement ended the annual stockholders meeting.

At its organizational meeting, the re-elected board declared a dividend on the common stock of 50 cents per share, payable March 23 to stockholders of record March 9. Earlier, the pension and social insurance program for all employes was approved as worked out last fall with the CIO United Steelworkers of America. Several opposition proposals to limit the powers of the board of directors were defeated.

Aluminum Output Near Capacity

San Francisco—Primary aluminum production in the Pacific Northwest for 1949 approximated 300,000 tons according to reliable sources. This is approximately one half of the national production of 603,500 tons as reported by the Aluminum Assn.

Production at the Northwest plants of Alcoa, Kaiser and Reynolds continues at near capacity levels. A $10,000 fire in the carbon block production room at Mead early this month caused a loss of one day's production of blocks but did not interfere with Kaiser's aluminum production.

Continental Steel Income Drops

Kokomo, Ind.—Earnings of the Continental Steel Corp. for 1949 amounted to $636,716, equal to $1.27 per share of common stock as against $3.24 a share in 1948. Net sales were $22.5 million, as compared to $29.7 million in 1948. The severe drop in earnings was mainly attributable to the steel strike.

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Blast Furnace Reactions Shown by High-Speed Movie

Pittsburgh — A high-speed motion picture showing what goes on inside a blast furnace will be featured at the annual meeting of the Eastern States Blast Furnace and Coke Oven Assn. to be held Feb. 24 at the William Penn Hotel.

Taken mostly at a speed of 3000 frames a second, the full-color film catches blast furnace reactions in slow motion. Incandescent particles of raw materials traveling at speeds estimated as high as 135 mph are shown.

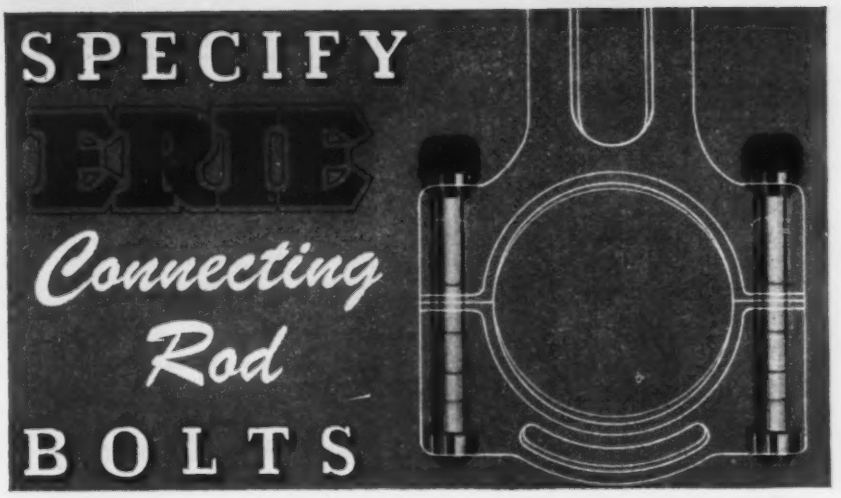
The movies were taken by Robert A. Buchanan of the U. S. Steel Corp.'s research laboratory under the direction of Dr. James B. Austin, research director at the Edgar Thomson Works of the Carnegie-Illinois Steel Corp., and at the Fairfield Works of the Tennessee Coal, Iron and R.R. Co.

The four reels, representing an entire year of research in high-speed photography, are part of a long-time blast furnace filming project. The camera was sighted through blast furnace tuyeres at hearth level for filming.

Tucker Group Offers Plan

Chicago—If it can only be manufactured, the Tucker Corp. has a product which will sell. That is what a group of Tucker dealers and distributors told court appointed trustees recently. The group presented a new plan for the reorganization of the now bankrupt and inoperative firm. The plan calls for the formation of a new company and issuance of five pct preferred stock, four and one pct debentures and 350,000 shares of common stock.

The common stock would be issued in exchange for common stock of the present company. The preferred stock would be made available for purchase by common stockholders, dealers, distributors and other creditors. The debentures would be bought by dealers according to a schedule based on the number of cars made and delivered to them for sale.



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The self-metering feed hopper arrangement permits the operator to pre load a one-half hour charge of work which is then continuously and uniformly processed without further attention, thereby eliminating costly man-hours. If desired, a continuous feeding mechanism may be employed which completely eliminates the need for an operator.

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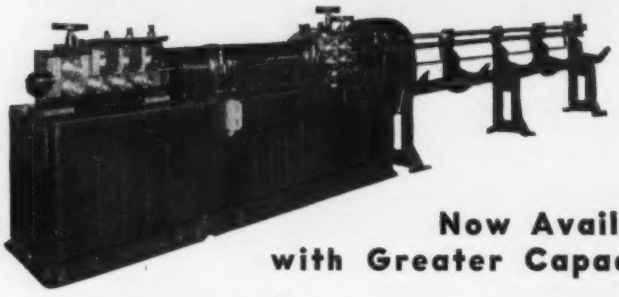

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Type 3A now straightens wire from ¼" to ½" dia., 9/16" in basic wire. Type 4A (similar to illustration) handles diameters from ⅜" to ⅝", 11/16" in basic wire. Other advantages are:

- Almost continuous wire travel
- Lightning cut-off assures square-cut ends
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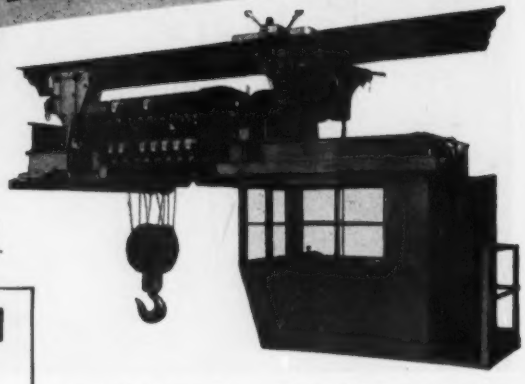
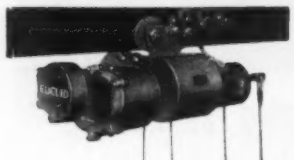


Write for Literature Describing EUCLID CRANES and HOISTS.



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Rivet Concern Plans Expansion

Los Angeles—Finding a growing demand from southern California industry, a tubular rivet company here is preparing new expansion which will make its size 40 times that of 4 years ago.

Pacific Rivet & Machine Co., which claims to be the only concern west of Chicago manufacturing tubular rivets, has announced plans for the installation of $60,000 worth of additional equipment to enlarge its capacity from 12 million to 20 million rivets a month.

Although the concern is small compared to some of the eastern manufacturers, it has expanded almost constantly since locating in Alhambra.

Last year it spent $40,000 in expansion. It now is manufacturing its own automatic setting machines.

Varied customers pour orders into the concern, which still does not have a sales force. The steel, brass and aluminum rivets, bored by an automatic punch, are used by General Electric Co., ladder companies, machine companies, and television units.

The company recently turned down an opportunity to bid on a large General Motors contract "because it was so big we would have had to put all of our eggs in one basket," Richard C. Cheek, secretary-treasurer, said.

Job Index Reflects Strike

Detroit—The effects of the Chrysler strike in Detroit are reflected in the latest employment index compiled by John R. Stewart, Industrial Department, Detroit Board of Commerce.

The Detroit employment index for Jan. 31 is 123.4 compared with 149.2 for Jan. 15. The index for Jan. 31, 1949 is 148.9.

Meanwhile, Detroit power consumption increased from 210 for December 1949 to 229 in January. A year ago the power index for the Detroit area was 228.

In compiling the Detroit index, the 1935-39 total equals 100.